RAILROAD GAZETTE

ESTABLISHED IN APRIL, 1856.

PUBLISHED EVERY FRIDAY BY THE RAILROAD GAZETTE AT 83 FULTON STREET, NEW YORK
BRANCH OFFICES AT 375 OLD COLONY BUILDING, CHICAGO, AND QUEEN ANNE'S CHAMBERS, WESTMINSTER, LONDON

EDITORIAL ANNOUNCEMENTS.

THE BRITISH AND EASTERN CONTINENTS edition of the Railroad Gazette is published each Friday at Queen Anne's Chambers, Westminster, London. It contains selected reading pages from the Railroad Gazette, together with additional British and foreign matter, and is issued under the name Railway Gazette.

CONTRIBUTIONS.—Subscribers and others will materially assist in making our news accurate and complete if they will send early information of events which take place under their observation. Discussions of subjects pertaining to all departments of railroad business by men practically acquainted with them are especially desired.

ADVERTISEMENTS.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and these only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

OFFICERS.—In accordance with the law of the state of New York, the following announcement is made of the office of publication, at 83 Fulton St., New York, N.Y., and the names of the officers and editors of The Railroad Gazette:

OFFICERS:

W. H. BOARDMAN, *Prest. and Editor*
E. A. SIMMONS, *Vice-President*
RAY MORRIS, *Secretary*
R. S. CHISOLM, *Treas.*
I. B. RINES, *Cashier*
L. B. SHERMAN, *Western Manager*

EDITORS:

RAY MORRIS, *Man'g Editor*
BRAMAN B. ADAMS
CHARLES H. FRY
RODNEY HITT
GEORGE L. FOWLER
FRANK W. KRAEGER
HUGH RANKIN
BRADFORD BOARDMAN

CONTENTS

EDITORIAL:

Railroad Telegraphers' Working Hours in New York State 85
The North Carolina Passenger Rate Law. 85
The New Expense Accounts 86
Track Circuits in Railroad Signaling 86
Evolution of State Railroad Commissions 87
Train Accidents in June 88
Private Car Owners Want More Pay 88

ILLUSTRATED:

Proposed Southern Pacific Hospital at San Francisco. 89

The Symmetrical Masonry Arch, Analysis According to the Elastic Theory 90
Increase in Weight of Locomotives 93
The Hail Electric Slot 95
Early Years of the Phila. & Reading ... 97

CONTRIBUTIONS:

A Criticism of the Salt Lake City Union Station. 88

MISCELLANEOUS:

Thirty-three Passengers Killed in Michigan 91
The Passing of the Pay Car 91
N. Y. Telegraphers' Hours-of-Labor Law. 94
Three Cent Fares in Cleveland 94
The Chemical Composition of Steel Rails. 96
Local Freight Agents' Association 96

GENERAL NEWS SECTION:

Notes 105
Interstate Commerce Commission Rulings 107
Trade Catalogues 108
Obituary 109
Elections and Appointments 109
Locomotive Building 109
Car Building 109
Railroad Structures 110
Railroad Construction 110
Railroad Corporation News 112

VOL. XLIII., No. 4. FRIDAY, JULY 26, 1907.

The state of New York is to regulate the working hours of railroad telegraph operators beginning October 1, or five months before the Federal law on that subject goes into effect. The New York act, given in another column, is so clumsily drawn that in parts it is difficult to make sense of it; but its main features appear to be: 1. Eight hours a day's work, except in extraordinary emergency, for all telegraph and telephone operators who have to do with the movement of trains, including despatchers at headquarters and towermen at interlockings. 2. Ordinary block signalmen communicating solely by bell code seem not to be included. 3. The penalty for violation lies against the railroad company, not the employee. 4. Half of any penalty recovered goes to the informer. 5. A road or part of a road running less than eight passenger trains each way each week day is exempt, unless it usually runs 20 freight trains each way each week day. The purpose of this law is commendable, but, like that already in force in Maryland, it may easily do much harm. On the Baltimore & Ohio some of the operators who had their hours reduced by the benevolent legislature for the purpose ostensibly of increasing the safety of trains, employed their freedom to work as operators for the Western Union, or in other outside business, thus increasing instead of diminishing the strain on their bodies and minds. This condition, and the impossibility of regulating by statute the management of operators in times of emergency, make plain the futility of a law of this kind, except as a lever to raise the operators' wages, which, no doubt, was its chief purpose. With suitable relief arrangements for Sundays and holidays, a ten-hour day is reasonable in the great majority of offices, and an eight-hour law is simply a crude measure for punishing those railroads which have paid stingy wages or have not employed enough relief operators. In the future as in the past the railroad superintendent who desires reliable service must depend, not on laws but on his own judgment and vigilance. To keep men from sleeping on duty, or from wasting their energies when off duty he will be obliged, first, to find operators with consciences and, second, to keep himself constantly informed as to how they habitually spend their time, for they will impair their efficiency by reason of bad judgment as well as from defective moral character. With roads as important as parts of the Delaware & Hudson main line exempted from this law, and with the different exceptions and hour limits in the Federal law, the situation on New York roads, after the Federal law goes into effect will be confusing. The most immediate and practical problem which an eight-hour law presents to the railroad manager is that of securing a supply of telegraphers. Good operators are scarce enough now. Unless we are going to use automatic block signals everywhere, or depend wholly on electric bells and telephones, it will be necessary to establish telegraph schools; and not only that, to also take the necessary measures to get competent young persons to enter the schools.

"It will be a sad day for the people of North Carolina when its citizens are prohibited by acts of the legislature from asserting any right guaranteed to them by the Constitution of the United States."—*Justice Pritchard.*

The law passed by the last North Carolina legislature forbidding the larger railroads to charge passengers more than 2¼ cents a mile went into effect July 1. The Southern Railway applied to the Federal Circuit Court at Asheville for an injunction, on the ground that this law was confiscatory and therefore repugnant to the Constitution of the United States. This injunction was granted, the court at the same time ordering that, pending a decision, the railroad should with each ticket issue a refund coupon representing in each case the difference between the existing rate and the rate proposed by the new law. This the railroad proceeded to do, charging for tickets at the old rates. Because they continued to sell tickets at the old rates the District Passenger Agent and the City Ticket Agent of the road at Asheville were arrested by the state authorities, indicted, tried in a state court and sentenced each to thirty days in the chain gang. Two days later Judge Pritchard, of the Federal court, issued writs of habeas corpus, under which the two passenger men were discharged, and the whole matter will be determined by the United States Courts. This action of the Federal

judge is suggestive of the protection which the United States courts can be depended on to give to corporations or individuals who are unconstitutionally oppressed by the operation of a state statute. It is particularly important, in view of the numerous cases in which the railroads are now facing serious reductions in earnings as a result of recently enacted state laws. Justice Pritchard in his opinion said:

"The penalties [$500 for each violation] prescribed by the state statute for charging more than the statutory rate are so enormous that if permitted to be enforced they would practically bankrupt the railroads in an exceedingly brief time and before a final hearing could be had in the case, and thus place the carrier in a position where it would be powerless to assert the right guaranteed to it by the constitution of the United States. If the criminal prosecution against the agents, conductors and employees is permitted to continue, the managers of the railroads cannot successfully operate their trains, carry the mails or continue their usefulness in interstate commerce . . . Any system of penalties which is intended to have the effect and which is so framed as to have the effect of closing the doors of the courts to a judicial inquiry as to rates, is, in consequence of that fact, unconstitutional and void. The penalty section of the act in question clearly attempts to do this. It imposes upon the company as a penalty for an unsuccessful attempt to appeal to the court, no matter how bona fide its bill is made, such enormous fines and penalties . . . as to burden the challenger of the act in the courts so as to make it, if the penalties were valid, practically impossible for such an appeal to be made."

There is nothing new or startling in this stand of the Federal court. The instance is only one more example—a gratifying one—of the value of the Federal courts as checks on hasty action of local officers. The people of North Carolina are entitled to have the low-fare question tested, but only in an orderly way. If 2¼ cents is too low a rate, the state may, by arbitrarily enforcing it, bankrupt its servants, the railroads, which make living in that state possible. The final decision will probably be referred with all possible despatch to the United States Supreme Court. In Alabama the low-rate law had a clause punishing every railroad which should even attempt to have its rights adjudicated by a Federal court by taking away its right to do business. This clause was promptly condemned by the Federal court. North Carolina has been equally fatucus and has been halted with equal suddenness.

THE NEW EXPENSE ACCOUNTS.

In our issue of June 21 we commented on the new classification of operating expenses ordered by the Interstate Commerce Commission to go in effect as compulsory on July 1. We criticised this accounting system, primarily on the ground that while the proposed system provided well for one primary use of statistics, it provided quite imperfectly for the other, that is to say, it gave a very good check on income and expenditures but did not afford executive officers the best possible measure with which to control the operation of their property. Besides this defect the requirement that a specific charge be made each year for depreciation of equipment and the likelihood that this compulsory depreciation allowance would be extended to way and structures, while theoretically correct, in actual practice is sure to do a great deal of harm to undeveloped or only partially developed properties which have always believed, in accordance with American railroad tradition, that it was better to expend money on the property when you had it and say nothing about it than to advertise to all the world that you were not spending money on the property because you did not have it to spend.

We urged in our brief comment on this subject that the enforcement of these regulations be postponed for a year. The Commission has shown no interest in this proposal, however, although it has received letters on the subject from a very considerable number of railroad executives. The situation as it stands, therefore, is that the railroads must keep a very elaborate set of primary expense accounts exactly in accordance with the forms set for them by the Interstate Commerce Commission. If they desire to keep other sub-divisions of these accounts besides those indicated by the Commission they may do so, subject to the Commission's approval, but they must at all events keep a mass of records, which, we must frankly say, have not been drawn up with the skill and thought which should have been given to a subject so important. The first revised issue of the classification of operating expenses took effect July 1, 1894, and the second revised issue became effective July 1, 1901. We think that the Interstate Commerce Commission will be the first party at interest to admit that these two previous classifications were imperfect, since, if the Commission did not consider them imperfect, it would presumably not have sought to change them. We are of the opinion that the errors in the new system are on the whole more hurtful than those in the old, and we believe it to be a matter of the greatest regret that at the time a change is made, to the very severe inconvenience of all concerned—a change, moreover, which works permanent injury to the continuity of records—that this change should not embody the very best thought of the day and generation.

The railroad accounting officers who co-operated with the statistician of the Interstate Commerce Commission in preparing these accounts did their work well so far as regards the function of account keeping with which they themselves were interested, but it is rather a ridiculous situation that the executive officers in charge of the property should be forced to accept a defective system of accounting which their own subordinate officers approved without acting or being empowered to act for their respective companies. A president or a general manager or a general superintendent, who is accustomed to use statistics with the skill and with the results obtained therefrom which have for many years occasioned American railroad statistics to excel those of all other nations in their scope and usefulness, ought surely to have a voice in a proposed change.

We believe that in spite of some individual hardships, the statistical systems of American railroads have been greatly improved since the Interstate Commerce Commission took hold of the matter in 1894. We believe that these statistical systems needed change, and that it is quite possible that the statistical systems of 1907 can be made to improve upon them materially in a number of particulars, but we are sure that the systems as now outlined by the Commission do not so improve upon the existing methods of record. In the good name of American railroad operation, therefore, why cannot the Commission leave it to be understood that its new orders, as promulgated, are experimental orders, and during the next year why can it not give earnest thought to the suggestions which have been made, and confer, not exclusively with one branch of statistical users, but with the other branch as well; that is to say, with the presidents and vice-presidents and general managers and general superintendents of American railroads? What is the use of violently overthrowing an existing statistical system to set up an inferior one in its place?

TRACK CIRCUITS IN RAILROAD SIGNALING.

The track circuit was put into practical use in automatic block signaling for the first time about the year 1879, having been experimented with for several years previous. These experiments appear to have consisted mainly of installing test sections and observing the results obtained from the use of various relays and track insulations. In this manner some information was gained as to the apparatus best suited to the usual conditions under which track circuits must work. If, along with these experiments or at any time since then, any series of tests were made, under the various climatic and physical conditions to which track circuits are subjected, to determine the electrical and insulation resistance of the track rails, the electrical resistance of bond contacts, the insulation resistance of insulated joints, the resistance of wheel contacts etc., such data seems never to have been given out for the public benefit.

Experience thus far seems to have taught us that a relay, with an electro-magnet having proportions and weight within certain limits, wound to a resistance of about four ohms and operating for pick up and release of armature at a minimum of about .065 and .030 amperes respectively, is the most satisfactory with the usual track circuit.

As track circuits equipped with such relays are credited with giving good service and as a series of tests to determine the characteristics and behavior of track circuits would entail not only considerable labor and expense but the use of some instruments which most signal engineers do not have, it is easy to understand why this subject has not been more thoroughly investigated.

Every signal engineer at times has track circuit failures, some of them serious, which he cannot understand and which he cannot find a reason for. Take, for example, the case reported by an engineman the other day where an automatic signal did "queer stunts" after the train had entered a 3,000-ft. track section at the battery end. Had the signal engineer known that the maximum resistance of the track circuit with its 80-lb. rail could be as much as .9 of an ohm; that the probable insulation resistance of the rails from the ground during the weather existing at the time was about five

ohms, and that the insulation resistance of the insulated joints at the relay end of the section had dropped to four ohms each, he could have readily figured the probable cause of the unruly behavior of the signal as leakage of current to the four-ohm relay of the section in question from the adjacent track circuit battery.

The track circuit does not seem to have received its full share of the investigation and improvement that have been under way in signaling during the last few years, and particularly so since it is now considered an essential factor in block signaling. It is doubtful if many signal engineers in planning their installations give it much consideration other than, perhaps, to fix a limit on its length and to make special provision for protection where a foreign current is known to exist.

It is apparent that the track circuit is regarded by many as a fixed institution in signaling, and that the positiveness of its operation under almost any condition or circumstance is beyond question or need of study. In view of the information and data on the subject available, ought this idea to prevail?

At the last meeting of the Railway Signal Association the following questions were presented for consideration, but provoked little discussion:

"1. It is noticed that when track relays are shunted, current is not entirely absent with a train in the block. What current does the relay receive under such conditions?

"2. Would a relay, able to pick up at .030 ampere and release at 50 to 75 per cent. of the pick up, be desirable; also, with such a relay, could longer blocks be used?

"3. What would the ideal pick up and release points be for a 4-ohm relay?"

These questions might well have engaged the attention of the members present, and along with them the following might have proved profitable:

(*a*) Are long track sections as safe, as efficient and as economical as short ones?

(*b*) Is not the pick up current of .065 ampere and the release current of .030 ampere, as lately adopted by the Railway Signal Association for track relays, too low for safe working under usual conditions?

(*c*) Should track circuits be installed with the expectation of as safe operation with trains entering from the battery end as from the relay end?

(*d*) Would not two bonds of No. 6 B. W. G. iron wire give better results in track circuit operation than two of No. 8?

(*e*) Should not the cross-section of the ballast grade and the kind of ballast used be given more consideration in the installation of track circuits than at present?

(*f*) Would not two relays, one a four-ohm and the other approximately 16 ohms, the latter placed, in multiple with the track battery, at the incoming end of the section, be better than one relay?

(*g*) If when track relays are shunted, current is not entirely absent with a train on the track circuit, is there a point in such section where the shunt by the train is equally effective at both ends of the section?

All of these are questions affecting the behavior of the track circuit which a committee of the Railway Signal Association, aided perhaps by the signal companies, would do well to investigate.

THE EVOLUTION OF STATE RAILROAD COMMISSIONS.

Mid-summer of the present year finds all the state legislatures adjourned, most of them after extended sessions prolonged very largely by railroad questions. The railroad legislation mania—most of it anti-railroad—has been far and wide. It has reached the East with hardly less violence than the West and the South; and, in a large number of cases has been attended either with the creation of new state railroad commissions or the equipping of existing commissions with fresh powers. About 40 states now have railroad commissions, strong or weak. Sometimes heretofore they have been strong in powers while weak in practice; in other cases weak by statute but strong by their intelligent leadership of public opinion. Taken as a whole, the result of the last six months of state lawmaking and, even more, of the popular attitude, has been positive and decided evolution of state railroad commissions. For better or for worse, they will, in the immediate future, be more assertive bodies.

The obvious tendency of the season's lawmaking has been to make the advisory into the regulating commission—and the word "regulating" must here be used in a very strong sense. It has extended not only to regulation of rates but to regulation of other matters too numerous to cite. One need only go to the Public Service Commissions Law of New York state to see what is meant; though this is one of the most extreme examples. In some of the states also, if we are not mistaken, where the powers of the commissions have previously been so extensive as to be almost farcical, they have been still further overloaded with functions. With existing problems of railroad regulation all the while growing more intricate it would seem as though railroad matters alone would give a state commission enough to do and more. But when to railroads is added warehousing, and to warehousing, the express business, and to the express business, the telephones and to the telephones, taxation and to all these—in some cases—general purview of corporations, it would seem as though legislators might have paused in the overloading process. The inevitable effect of this overburdening of a commission is to make it a jack of all trades and master of none. Yet in some states the revision of the commission laws makes one think of courts and legislatures rolled into one and vested by law with omniscience.

A bad feature of this radical evolution of the state commissions has been a kind of compulsory demagogism. That which is created, by the inexorable law of human nature, must reflect the spirit and policy of the creator. It is too much to expect that commissions, most of them made up of politicians, will set themselves against a tide of hostile popular and legislative sentiment, even though transitory. In the past, some commissions have been too subservient to the railroads. In most cases now and for some time to come, the railroads are likely to find such commissions hostile, not as an expression of real feeling, but as a matter of personal policy in order to hold their places. Sympathy in such cases with railroad corporations is not unqualified. In the past they have been content with the "political" commission as being one that could be "handled," if not otherwise, by the infirmity of its own ignorance. Would it not have been better if, in years gone by, the railroad influence had been more freely used for infusing intelligence in the railroad commissions even at the price of their greater independence? This moral default of the railroads heretofore, to a considerable degree spells demagogism now. Corporation foresight might have averted some of the present sad reflections of hindsight.

But in the radical evolution of railroad commissions we front a condition, not a theory, and the primary question is the extraction from that condition of the final equities. Here there is solid ground for hopefulness. Remembering that it is the *personnel* of a state railroad commission that counts, it requires no excess of optimism to discover in present radicalism an ultimate residuum of good. Nothing tries out incompetency like responsibility. It is the overdoing of a bad system or bad thing that brings its ultimate correction. The wider and more ramified the functions of a state commission that is inefficient or invertebrate, the surer is its exposure and the louder the call for brains and courage. Again, as the functions of the commissions grow more and more technical, the more conspicuous to both public and legislative vision becomes the need of the trained mind. A force working toward the same end is the advance into debatable ground of the state and interstate questions relating to public service, where the demand for intelligence and special knowledge on both sides is imperative. Finally there are the courts in their double office of nullifying bad commission rulings and exposers of commission weakness; while, as regards demagogical drift of the public and its law makers, it can hardly survive any really serious railroad calamity that touches the pocket nerve and the means of livelihood. It will not be surprising if next year's sessions of the state legislatures, as concerns the railroads, prove as tame as those of the past six months have been fierce.

Deeper searched and tried, that period beginning with the opening of the present year, though one of storm, will probably in the outcome be deemed a clarifying tempest in its development of the railroad commissions. They are now bodies in transition and it rests partly with them, partly with the public and partly with the railroads to determine whether the transition shall be upwards or downwards and whether the personality of the political officeholder shall or shall not give way to character and training. Without these last, railroad law may be piled on law and powers be amplified or restricted, but all in vain. Toward that higher ideal of state commissions better qualified than now, it looks as though events were trending under the urgency and gravity of the railroad problem. Two or three years hence—perhaps earlier—there will be sharper light on the subject after we begin to see clear water below the weltering foam of the railroad legislation of the last half year.

Train Accidents in June.[1]

Our record of train accidents occurring on the railroads of the United States in June includes 16 collisions and 27 derailments, 38 accidents in all. This record is not published in full, as was formerly done, except in the cases of the few accidents which are especially prominent—in the present instance two collisions and one derailment. The record of "ordinary" accidents—which term includes, for our present purpose, only those which result in fatal injury to a passenger or an employee or which are of special interest to operating officers—is given in the shape of a one-line item for each accident, showing date, location, class and number of deaths and injuries.

This record is based on accounts published in local daily newspapers, except in the cases of accidents of such magnitude that it seems proper to send a letter of inquiry to the railroad manager. The official accident record published quarterly by the Interstate Commerce Commission is regularly reprinted in the *Railroad Gazette*.

The most serious accident in the present list is the collision which occurred at Hartford, Conn., on the 23d, killing eight employees. The next most serious is the collision near Pittsford, N. Y. There are only three others in the list which caused the death of more than two persons each.

The Hartford collision, which happened about 7 p.m., appears to have been within or near the yard limits. The main line of the Highland division of the New Haven road from Hartford westward consists of two tracks, but it is operated as two separate single-track lines, one of the tracks being used exclusively by frequent short-distance passenger trains which formerly were propelled by electricity. It appears that one of these passenger trains backed through a cross-over track on to the other main track in entire disregard of the fact that a work-train had the right of way on that track; and it collided with the caboose of the work train, wrecking the car and killing or injuring nearly all of the 40 men who were in it. The wreck took fire but the flames were quickly extinguished by the city firemen. Two of the injured men subsequently died, making the total number of fatalities 10.

The collision at Pittsford occurred about 11 p.m., and the persons killed were a station agent, one passenger, a brakeman, an unidentified man, and a boy who was riding on one of the locomotives. The trains were an eastbound passenger train and a westbound freight; both engines were wrecked and the smoking car of the passenger train demolished. The wreck took fire but the damage from the flames was not great. The freight train was wrongfully running on the time of the passenger train.

In the derailments on the Southern Railway the 5th and the Great Northern the 15th, passenger trains were thrown down embankments with much damage. In the Great Northern accident the whole train of nine cars took fire and was burned up, with the exception of a mail car. In the derailment on the Southern Pacific on the 2d, the passenger cars were overturned while running at full speed at 3 a.m. The derailment on the Baltimore & Ohio Southwestern on the 20th at 4 a.m. was due to the fall of a rock in a tunnel which occurred at the precise moment that the mail car of this train was passing the spot.

The persons recorded as killed and injured in connection with the derailment at Reddick, Ill., on the 4th were by-standers who were killed or injured by the explosion of a car of gasolene some little time after the cars had run off the track. The heated journal which caused the derailment set fire to the wreck and as one of the cars was loaded with gasolene, the explosion was inevitable. It broke windows and chimneys in houses throughout the village.

One accident, not prominent by reason of cost or fatality, was notable for its novelty. It was a derailment at Suspension Bridge, N. Y., on the 15th. Three freight cars broke from a Grand Trunk train of 14 cars in the middle of the steel arch bridge and plunged into the Niagara Rapids, 250 ft. below. In leaving the track the cars did considerable damage to the upper and lower decks of the bridge. When they struck the water they were not badly injured, but the current of the rapids carried them to the whirlpool, where they were broken into pieces. A brakeman had a narrow escape.

TRAIN ACCIDENTS IN THE UNITED STATES—JUNE, 1907.

Collisions.

Date.	Road.	Place.	Kind of Accident.	Kind of Train.	No. persons reported Kil'd.	Inj'd.
1.	Birmingham Southern.	Pratt City.	xc.	Ft. & Ft.	1	4
1.	Atch., Top. & S. Fe.	Sewell, O. T.	bc.	P. & Ft.	1	10
2.	Penn. Lines.	New Phila.	rc.	Ft. & Ft.	0	4
*4.	N. Y., N. H. & Hart.	Worcester.	xc.	Ft. & Ft.	0	3
6.	Southern Pacific	Lordsburg.	xc.	Ft. & Ft.	1	0
6.	Atch., Top. & S. Fe.	Paul's Valley.	bc.	Ft. & Ft.	0	2
7.	Wabash-Pitts.	Hickory.	xc.	P. & Ft.	2	11
8.		Junction City.	xc.	Ft. & Ft.	2	0
12.	Southern Pacific	Santa Cruz.	bc.	Ft. & Ft.	2	17
14.	Southern Pacific	Deming.	bc.	P. & P.	0	1
17.	Southern	Sylva.	rc.	Ft. & P.	1	1
18.	Delaware & Hudson.	Bainbridge.	rc.	Ft. & Ft.	2	3
*23.	*N. Y. C. & H. R.*	Pittsford.	bc.	P. & Ft.	4	11
23.	Pennsylvania	Sharon, Pa.	xc.	Ft. & Ft.	0	8
23.	*N. Y., N. H. & Hart.*	Hartford.	xc.	P. & Ft.	8	35
27.	Pennsylvania	Cynwyd.	xc.	P. & Ft.	1	8

Derailments.

Date.	Road.	Place.	Kind of train.	Cause of derlmt.	No. persons reported Kil'd.	Inj'd.
†2.	Southern Pacific	Lozier, Tex.	Pass.	unx.	1	20
2.	Chic., R. I. & Pac.	Prairie Home.	Pass.	unx.	0	3
2.	Atch., Top. & S. Fe.	Ortiz.	Ft.	unx.	1	0
3.	Chic., Burl. & Quincy.	Chicago.	Ft.	loose rail.	1	1
3.	Pennsylvania	Severance,N.Y.	Ft.	unx.	2	0
4.	Atlanta, B. & A.	Rebecca.	Pass.	unx.	1	4
*4.	Chic., Ind. & S.	Reddick.	Ft.	hot box.	3	10
5.	Southern.	Black Branch.	Pass.	unx.	0	16
6.	Gulf C. & S. F.	Browndell.	Ft.	brake-bm.	1	5
8.	Chic., R. I. & Pac.	Horton.	Ft.	unx.	2	2
8.	Hous., E. & W. T.	Goodrich.	Ft.	unx.	2	0
9.	Montana C.	Great Falls.	Ft.	b. rail.	1	0
14.	C., C., C. & St. L.	Graysville.	Ft.	unx.	1	0
14.	Pennsylvania	Pt. Lookout	Ft.	unx.	1	0
*15.	Great Northern	Palermo.	Pass.	b. rail.	0	17
15.	*Grand Trunk.*	Suspnsn Bdg.	Ft.	unx.	0	0
†17.	Atch., Top. & S. Fe.	Earl.	Pass.	unx.	3	18
18.	C., C., C. & St. L.	Columbus.	Pass.	ms.	0	6
19.	Denver & Rio G.	Florence.	Ft.	boiler.	3	0
20.	Balt. & O. S. W.	Mitchell.	Pass.	acc. obst.	0	17
20.	Phila. & Readg.	Perkiomen Jn.	Ft.	derail.	1	0
21.	Northern Pacific.	Detroit.	Ft.	neg.	2	1
22.	Pitts. & Lake Erie.	Pittsburg.	Pass.	d. switch.	1	10
23.	Texas & Pacific.	El Paso.	Ft.	unx.	1	1
27.	Cripple Creek.	Cameron.	Ft.	unx.	1	1
*29.	Maine Central	Waterville.	Pass.	unx.	0	6
30.	St. Louis & S. F.	Springdale.	Pass.	d. track.	0	11

Of the electric car accidents reported in the newspapers in June, four—two collisions and two derailments—resulted fatally; the total deaths reported in the four accidents being six and the total injuries 50.

[1]Abbreviations used in Accident List:

rc.....Rear collision.
bc.....Butting collision.
xc.....Other collisions; as at crossings or in yards. Where only one train is mentioned, it is usually a case of a train running into a standing car or cars, or a collision due to a train breaking in two on a descending grade.
b.....Broken.
d.....Defective.
dr.....Defect of roadway.
eq.....Defect in car or engine.
n.....Negligence.
unf.....Unforeseen obstruction.
unx.....Unexplained.
derail.....Open derailing switch (negligence of engineman or signalman).
ms.....Misplaced switch.
acc. obst..Accidental obstruction.
malice....Malicious obstruction of track or misplacement of switch.
boiler.....Explosion of boiler of locomotive on road.
fire.....Cars burned while running.
Pass.....Passenger train.
Ft.....Freight train (includes empty, engines, work trains, etc.).
*Wreck wholly or partly destroyed by fire.
†One or more passengers killed.

Robert J. Bailey, of the Monongahela River Consolidated Coal & Coke Co., which company owns 600 coal cars, has invited other private car owners to attend a meeting in Cleveland next Thursday with a view to presenting a united demand upon the railroads for greater compensation for the use of private cars in freight service. Formerly the rate paid for private cars was the same as that paid by the railroads to each other for the use of cars owned by the railroads, namely three-fourths of a cent a mile. Later the interchange rate between railroads was reduced to six-tenths of a cent, but the rate for private cars was left unchanged. Five years ago the railroads adopted the per diem system for their own cars, but continued the mileage rate for private cars, most or all of the private car owners finding that the per diem basis (20 cents a day at first and later 25 cents) was less profitable to them than the mileage rate. But now, with the per diem rate for railroad companies' cars raised to 50 cents, the boot is on the other foot; or at least it appears that it is so in some cases. Fifty cents a day is likely to average a good deal better than 7½ mills a mile, or even 1 cent a mile, and so, of course, the private car owners will now go in strong for reform. And how can the railroads refuse? Quite likely many of them will not want to refuse; but whatever the inclination of any road may be, the only reasonable and just stand to take is to approve a change to per diem. The per diem principle was adopted by the railroads as between themselves, not because it was more profitable—though to lenders it usually was profitable—but because it was rational and because by its use it is possible to do away with the opportunity for injustice and error that is inherent in the mileage system. If there is any difference between the railroads and the private car owners it should be one of rates and not one of methods. Fifty cents a day may or may not be a fair price—as between railroads the rate is supposed to be unimportant, as both sides are or should be lenders and both sides borrowers—but any mileage rate is unfair because it is not based on the actual service of the car.

CONTRIBUTIONS

A Criticism of the Salt Lake City Union Station.

Pittsburg, Pa., July 15, 1907.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The *Railroad Gazette* of July 12 contains an article describing the new union station to be built by the Harriman Lines at Salt Lake City. Presumably the publication of such an article is an invitation to your readers to criticise the lay-out. If so, it seems permissible to remark that it is a conspicuous illustration of inef-

ficiency per unit of cost. The passenger station, which is to cost $450,000, seems intended to provide for a very large business. Seven through passenger tracks with island platforms and two local or terminal tracks are shown behind the station. This indicates a large contemplated passenger train movement. It is probable that the station is to be used by passenger trains in both directions, yet all baggage must be handled at the western ends of the platforms. This means that baggage to and from eastward trains—having the baggage car in front—must be conveyed almost the entire length of the various platforms, apparently at grade, with great delay, expense of handling and inconvenience to passengers.

Just how the express and mail matter is to be handled between the rooms at the easterly end of the building and the trains is not clear. Apparently it is to be conveyed across the tracks at grade and then along the island platforms, like the baggage. It looks as if an additional tunnel or subway across the tracks near the east end of the station with lifts at the island platforms and a longitudinal subway to the basement should be added, even at the expense of cutting out some of the aesthetic features of the building, if necessary to reduce the cost. Another alternative would be to build a tunnel for baggage, express and mail opposite the center of the station with a longitudinal tunnel and lifts at both ends of the building. We think there would be no doubt of the adoption of one or the other of these alternatives east of the Mississippi river.

The arrangements for handling passengers between the station and trains are apparently quite as archaic as those for handling baggage, mail and express. The communication between the waiting room and the trains is apparently by a grade crossing of the tracks in front of the waiting room and by the island platforms. This practically restricts the station to handling one, or not more than two, trains at a time, unless the trains are quite short, not exceeding 440 ft. long. It is not clear why seven passenger tracks are neeeded at a station where but one train at a time can be handled. The inefficiency of such an arrangement may be seen daily at the Mount Royal station of the Baltimore & Ohio in Baltimore, at the Union Station of the Pennsylvania Railroad in Baltimore, and at the Pennsylvania station in Altoona, although at none of these points, if I recollect correctly, are there more than five tracks. A similar lay-out formerly existed at the Pennsylvania station at Harrisburg, but several years ago it was found necessary to change it by installation of overhead bridges from the waiting room to the island platforms, so that trains could be handled on all of the tracks simultaneously. The fact is that such a lay-out is at least 20 years behind the times.

I must confess to a feeling of some astonishment that the management of the Harriman Lines, whose reputation for efficiency is high, should have adopted such a lay-out, and that the *Railroad Gazette* should publish a description of it without an explanation of its necessity or a word of warning that it was intended to instruct the public as an example of how not to do it. S.

Proposed Southern Pacific Hospital at San Francisco.

The Southern Pacific is soon to build a new railroad hospital in San Francisco to replace the one last year destroyed by fire. The site is the block north of the entrance to Golden Gate Park bounded by Fell, Hayes, Baker and Lyon streets. The new hospital will have 225 beds and will cost $600,000.

The building, which will be built largely of reinforced concrete, will be in the form of an "H." There will be an east and a west wing with an administration building in the center connected with the wings by wide corridors. The main front of the building will be 220 ft. 8 in. on Fell street. Each wing will be 86½ ft. x 150 ft., with the administration building 72 ft. x 108 ft. There will be four stories. The frame will be reinforced concrete with the outside walls brick and the outside surface finished in white stucco. All partitions will be made of steel studs with metal lath and plaster and the floors of glazed ceramic tiles of different patterns. The only woodwork in the building will be the doors and windows. The different floors will be connected by easy inclines, thus avoiding the necessity of stairs, and there will be two elevators, one for general passenger service and the other to be used in connection with the ambulances and the operating room. A vacuum and cleaning plant is to be installed and all food rooms are to be cooled with a brine system of refrigeration. On each floor above the basement the corridors connecting the wings with the central part of the building have been widened so as to form sun rooms with large glass windows.

Proposed Southern Pacific Hospital at San Francisco.

On the lower or basement floor is the kitchen, with all necessary store and refrigerator rooms, dining-rooms, bath-rooms, drug-room and chemical laboratory, X-ray, hot and steam rooms, machinery room, and foreign wards with their dining-rooms in connection. In each wing on the first floor are to be two 12-bed wards with their service kitchen, bathrooms and rooms for nurses and internes, while the administration building on this floor has two large general waiting rooms for men and women, a library, offices for the chief surgeon and staff, with consultation, examination and dressing rooms. Each wing on the second floor is like the first floor, having two 12-bed wards, with service kitchens in connection, while the administration building on this floor has two 8-bed and three 2-bed wards, three single rooms with bath and nurses' rooms.

On the third floor there are two 8-bed and two 12-bed wards and 17 private rooms, with private room for visiting doctors, all equipped with service rooms, baths, nurses' rooms, etc. In the rear of the administration building, on this floor, are two large operating rooms connected with the sterilizing and anesthetic room, nurses' rooms and baths for doctors and nurses. The floors and wainscot of the operating, sterilizing and anesthetic room will be of ivory white unglazed vitrified tile, with wide plate glass windows, giving ample light.

In the rear of and directly opposite the center of this main building will be a four-story building 52 ft. x 116 ft. 9 in.,

and of the same construction, detail and finish. This to be used for the accommodation of the entire hospital staff. On the second and third floor of this annex will be four 6-bed wards, isolated by solid brick walls, to be used for contagious diseases.

The ideas and plans for the systematic operation of this large hospital plant are the work of Dr. F. K. Ainsworth, Chief Surgeon of the Southern Pacific. All details have been carried out according to his instructions. E. H. Harriman, President of the Southern Pacific, enlisted the services of Carrere & Hastings, architects, of New York City, in suggesting a design for the exterior. All plans for the work were prepared in the office of J. H. Wallace, Assistant Chief Engineer, and D. J. Patterson, Architect, of the Southern Pacific.

The Symmetrical Masonry Arch; Analysis According to the Elastic Theory.

BY MALVERD A. HOWE.

It has been established experimentally that the deformations of a masonry arch under a given loading correspond to those determined theoretically by means of formulas based upon the theory of elasticity. It may be concluded from this that the stresses within the arch ring vary according to the same theory. Only recently has the elastic theory been applied to masonry arches. A complete analysis is seldom made and quite often none is attempted, the dimensions of the arch ring being simply guessed or copied.

Much the same method was employed by the old builders of wooden bridges. They, to a certain extent, were excusable, as the theory of stresses was not commonly known in their time. But the designers of masonry arches in the present time have no such excuse as the elastic theory has been thoroughly worked out. It is true that the formulas and graphical methods have not, as yet, been made so short that anyone not familiar with the subject can in a few moments pass upon the correctness of a given design submitted for approval.

It requires time to check a design for an ordinary truss bridge, and there appears to be no good reason why the same amount of time should not be willingly spent in checking a design for a masonry arch. It is not necessary to determine the stresses for every possible loading upon an arch in order to be reasonably sure that the design is safe.

Assume that a design has been submitted and that its safety is questioned. The following method enables one to answer the question in a comparatively short time. Divide the span into 20 equal parts δx, and at the center of each division draw vertical lines cutting the axis of the arch ring. Beginning at the left, number the points so found on the axis 1, 2, 3, etc., up to the crown and number the symmetrical points upon the right of the crown 1^1, 2^1, 3^1, etc. Scale the co-ordinates of these points and call them x and y, the origin being taken at the left support. At each point scale along the axis to the right and to the left to a point half way to the adjacent points and call the sum of these distances $\delta \varsigma$. Or, if the arch axis is a curve of known radii the angle Φ from the crown to each point may be computed and then $\delta \varsigma = \delta x$ secant Φ. Compute the moment of inertia I at each point and let $\Delta = \delta \varsigma \div I$ for each point. This will usually have a different value for each of 10 points on the left of the crown. The same values will, of course, obtain for the corresponding points upon the right of the crown.

If H_1 represents the horizontal thrust produced by vertical loading then

$$2\,H_1 = \frac{\Sigma\, m_x \Delta \left(y - \frac{\Sigma\, y\, \Delta}{\Sigma\, \Delta}\right)}{\Sigma\, y\, \Delta \left(y - \frac{\Sigma\, y\, \Delta}{\Sigma\, \Delta}\right)}$$

in which all of the factors are known quantities depending upon the dimensions of the arch ring, the shape of the axis, etc., and entirely independent of the loading, *with the exception of* m_x. The sign of summation indicates the sum of the factors for all points of the axis. In this case 20 in number. For example

$$\Sigma\, y\, \Delta = y_1 \Delta_1 + y_2 \Delta_2 + y_3 \Delta_3 \ldots\ldots\ldots\ldots\ldots\ldots y_{1'} \Delta_{1'}$$
$$\Sigma\, \Delta = \Delta_1 + \Delta_2 + \Delta_3 + \ldots\ldots\ldots\ldots\ldots\ldots\ldots \Delta_{1'}$$

etc., etc.

In Form A, columns 1 to 6 inclusive show the computations to be made. These are made but once as they are constant for the given arch ring. The factor m_x depends upon the loading. The loadings which should be considered are as follows:

(a) Load points, 1—1′ inclusive.... } { With a concentration
(b) " " 1—8′ " } { equivalent to uniform
(c) " " 9—1′ " } { moving load per ft. of
(d) " " 1—8′ & 8—1′ " } { span multiplied by
(e) " " 9—9′ " } { δx.
(f) Dead or fixed load alone.

Only (a), (b) and (f) need to be considered in computing H_1, as the values for the remaining loadings can be found by proper combination of the results obtained for (a), (b) and (f). These combinations are given in Form A.

The value of m_x at each point is simply the common bending moment produced by the given loading on a straight beam supported at the ends and having a span equal to that of the arch axis, *plus the common bending moment produced by an equal and symmetrical loading.*

In case of the dead load m_x is equal to *twice* the common moment as found from the ordinary equilibrium polygon. For a uniform load covering the entire span the same is true. In Form A the values of these moments divided by $\frac{1}{2}\ \delta x$ for each point are given for a unit load at each point. For any other load, multiply by the load. The values of $m_x \frac{2}{\delta x}$ are also given for unit loads at 1-8 inclusive in Form A. The sums of columns 10 and 12 must be multiplied by $\frac{1}{2}\ \delta x$ before substituting in the expression for $2\ H_1$ as indicated.

When the computations according to Form A are completed the values of H_1 for six different loadings are known and at an expense of but little time and labor. Any other loading such as a road roller can be considered in a like manner, remembering the significance of the factor m_x.

The next step is the determination of the moments at the left and right supports. Let them be represented by M_1 and M_2 respectively, then for all symmetrical loading such as a uniform load covering the entire span or the dead load in a majority of cases,

$$M_1 = H_1 \frac{\Sigma\, y\, \Delta}{\Sigma\, \Delta} - \frac{\Sigma\, m_x\, \Delta}{\Sigma\, \Delta} = M_2$$

in which m_x is the common moment at each point produced by the given loading on a beam supported at the ends.

All factors in the first term of the second member of this equation are known in computing the quantity $\Sigma\, m_x\, \Delta$. The values of m_x for each pair of symmetrical points may be combined and the sum multiplied by the common value of Δ for these two points. Table B gives the values of m_x so combined for a unit load at each point 1—1^1 inclusive. The computation of $\Sigma\, m_x\, \Delta \div \Sigma\, \Delta$ is a very short process. Having H_1 and M_1 for any given symmetrical loading and since $V_1 = V_2 =$ one-half the loading, the equilibrium polygons can be readily constructed in their true relation to the arch axis. The ordinate between the arch axis and the equilibrium polygon at the support equals $M_1 \div H_1 = y_1$.

The equilibrium polygon may be located in another way. Above the spring line a distance $\Sigma\, y\, \Delta \div \Sigma\, \Delta$ and parallel to the chord of the arch axis draw a straight line A B. Construct the equilibrium polygon with a horizontal closing line, using the true H_1 as a pole distance. Above this line a distance $\Sigma\, m_x\, \Delta \div \Sigma\, \Delta$ draw a line $A^1\ B^1$ parallel to the closing line. If now the two figures be superimposed so that these two lines A B + A^1 B^1 coincide

Form A.— To be Used in Computing H_1.

	1	2	3	4	5	6	7	8	9	10	11	12
			(1)x(2)		(3)x(4)	(2)x(4)		(6)x(7)		(6)x(9)		(8)x(11)
Point	y	Δ	$y\Delta$	$y - \frac{\Sigma y\Delta}{\Sigma\Delta}$	$y\Delta\left(y - \frac{\Sigma y\Delta}{\Sigma\Delta}\right)$	$\Delta\left(y - \frac{\Sigma y\Delta}{\Sigma\Delta}\right)$	Dead Load	$m_x\Delta\left(y - \frac{\Sigma y\Delta}{\Sigma\Delta}\right)$	Unit load at 1-8 inclusive m_x	$m_x\Delta\left(y - \frac{\Sigma y\Delta}{\Sigma\Delta}\right)$	Unit load at 1^1-8^1 inclusive m_x	$m_x\Delta\left(y - \frac{\Sigma y\Delta}{\Sigma\Delta}\right)$
1							Insert TWICE the common moment for the D.L. on a beam supported at the ends		8		20	
2									22		56	
3									34		88	
4									44		116	
5									52		140	
6									58		160	
7									62		176	
8									64		188	
9									64		196	
10									64		200	
Sum												
	$\frac{1}{2}\Sigma y$	$\frac{1}{2}\Sigma\Delta$	$\frac{1}{2}\Sigma y\Delta$		$\frac{1}{2}\Sigma y\left(y - \frac{\Sigma y\Delta}{\Sigma\Delta}\right)$			$\frac{1}{2}\Sigma m_x\Delta\left(y - \frac{\Sigma y\Delta}{\Sigma\Delta}\right)$		$\frac{1}{2}\Sigma m_x\Delta\left(y - \frac{\Sigma y\Delta}{\Sigma\Delta}\right)\frac{2}{\delta x}$		$\frac{1}{2}\Sigma m_x\Delta\left(y - \frac{\Sigma y\Delta}{\Sigma\Delta}\right)\frac{2}{\delta x}$

$$2H_1 = \frac{\frac{1}{2}\Sigma m_x \Delta\left(y - \frac{\Sigma y\Delta}{\Sigma\Delta}\right)}{\frac{1}{2}\Sigma y\Delta\left(y - \frac{\Sigma y\Delta}{\Sigma\Delta}\right)} \qquad \frac{\delta x}{2} = \frac{1}{40}$$

H_1 for loads 1-8 and 8′-1′ = $2H_1$ for loads 1-8
H_1 for loads 9-1′ = H_1 for loads 1-1′ minus H_1 for loads 1-8
H_1 for loads 9-9′ = H_1 for loads 1-1′ minus H_1 for loads 1-8 and 8′-1′

then the equilibrium polygon is in its correct position relative to the arch axis. For unsymmetrical loading

$$\left.\begin{matrix} M_1 \\ M_2 \end{matrix}\right\} = H_1 \frac{\Sigma y\ \Delta}{\Sigma\ \Delta} - \left\{ \frac{\Sigma m_x \Delta}{\Sigma\ \Delta} \pm \frac{\Sigma m_x \Delta \left(x - \frac{l}{2}\right)}{\Sigma\ \Delta \left(n - \frac{\Sigma\ z^2\ \Delta}{n\ \Sigma\ \Delta}\right) \frac{\delta\ x}{2}} \right\}$$

The factors in the first and second terms of the second member have the same significance as for symmetrical loading. In the third term m_x is the simple moment for the given loading on a beam supported at the ends. As $\Delta \left(x - \frac{l}{2}\right)$ has two equal symmetrical values but *opposite in sign* for each pair of symmetrical points, the symmetrical values of m_x may be combined and the *difference* multiplied by the common value $\Delta \left(x - \frac{l}{2}\right)$. This is shown in Form B for loads 1-8 inclusive. In the denominator of the third term, n is 20 the number of the equal divisions into which the span was divided. $z = 2\ x \div \delta\ x$ and has the values 1, 3, 5, 7 .... 39. Since Δ is the same for a pair of symmetrical points, the symmetrical pairs of values of z^2 have been combined in Form B. Form B is quickly filled, and as a result the values of M_1 and M_2 for six different loadings are known.

Form B.—To be Used in Computing M_1 and M_2.

	1	2	3	4	5	6	7	8	9	10	11	12	13
				Dead Load		Unit Loads 1-1'		Unit Loads 1-8					
			(1)x(2)		(1)x(4)		(1)x(6)		(1)x(8)		(3)x(10)		(1)x(12)
Point	Δ	$x-\frac{1}{2}l$	$\Delta(x-\frac{1}{2}l)$	m_x	$m_x\Delta$	m'_x	$m'_x\Delta$	m''_x	$m''_x\Delta$	m'''_x	$m'''_x(x-\frac{1}{2}l)\Delta$	z^2	$z^2\Delta$
1				Moments produced by D.L. on beam supported at ends		20		8		4.8		1522	
2						56		22		12.4		1378	
3						88		34		18.0		1250	
4						116		44		21.6		1138	
5						140		52		23.2		1042	
6						160		58		22.8		962	
7						176		62		20.4		898	
8						188		64		16.0		850	
9						196		64		9.6		818	
10						200		64		3.2		802	
Sum													
					$\frac{1}{2}\Sigma m_x\Delta$		$\Sigma m_x\Delta\frac{\delta^2 x}{2}$		$\Sigma m''_x\Delta\frac{\delta^2 x}{2}$		$\Sigma m'''_x\Delta(x-\frac{1}{2}l)\frac{\delta^2 x}{2}$		$\Sigma z^2\Delta$

For symmetrical loading $M_1 = H_1 \frac{\Sigma y\Delta}{\Sigma\Delta} - \frac{\Sigma m_x\Delta}{\Sigma\Delta} = M_2$

For unsymmetrical loading $\left.\begin{matrix} M_1 \\ M_2 \end{matrix}\right\} = H \frac{\Sigma y\Delta}{\Sigma\Delta} - \left\{ \frac{\Sigma m_x\Delta}{\Sigma\Delta} \pm \frac{\Sigma m_x\Delta\,(x-\frac{l}{2})}{\Sigma\Delta(n-\frac{\Sigma z^2\Delta}{n\Sigma\Delta})\frac{\delta x}{2}} \right\}$

M_1 for loads 1-8 and 8'-1' = $M_1 + M_2$ for loads 1-8
M_1 for loads 9-1' = M_1 for loads 1-1' minus M_1 for loads 1-8
M_1 for loads 9-9' = M_1 for loads 1-1' minus M_1 for loads 1-8 and 8'-1'

For any loading the left reaction is found from the expression

$$V_1 = \frac{M_2 - M_1}{l} + R_1$$

where l is the length of the span and R_1 the common reaction for the given loading on a beam supported at the ends. Knowing H_1 M_1 and V_1 for any loading the true equilibrium polygon can be readily constructed.

The moving loads employed in Forms A and B produce maximum moments at the supports, the crown and in the vicinity of point 6¹ with a close approximation.

Thirty-three Passengers Killed in Michigan.

On the Pere Marquette Railroad near Salem, Mich., July 20, 33 passengers, nearly all of them employees of the railroad company, were killed in a butting collision between an eastbound passenger train and a westbound freight, and about 75 others were injured. These people were employees of the company, chiefly at Ionia, who were taking their annual excursion to Detroit, the special train being run for their accommodation. The passenger train met the freight in a cut on a sharp curve about one mile east of Salem. Two of the passenger cars were completely wrecked. The only explanation of the accident is that the conductor and engineman of the freight, who had received an order from the despatcher giving the times of the excursion train at the successive stations, misread the order. The enginemen and firemen of both trains jumped off and, it appears, escaped without very serious injury.

A press despatch from Detroit says that Receiver Harmon, in charge of the operation of the road, has given orders that all the victims of the wreck be settled with the same as if they were passengers who had paid their passage.

The conductor of the freight train, it is said, has acknowledged that he read his orders wrong. He was arrested. Press despatches say that the engineman, fireman and one brakeman also read the orders wrong, reading that the time for Salem on the order was 9.25, when it was really 9.10. The engineman is at his home confined to his bed by injuries.

The Passing of the Pay Car.*

Republished from The American Magazine for July. Copyrighted, 1907, by The Phillips Publishing Co.

Railroading isn't any fun any more. Sordid commercial folk in Wall street, with never an idea in their noggins but to invest money and make it pay dividends, have improved all the romance out of life on the rails.

They have reduced grades and straightened kinks and eliminated low joints and high centers and wooden culverts and crazy bridges until a ride over the division is about as thrilling as walking to church. Air-brakes have so thoroughly crowded out the good old Armstrong kind that a brakeman has no use for skill or judgment or muscle or even a vocabulary in stopping a train. The engineer does all that is necessary with a slight twist of the wrist.

As for making a coupling, a brakeman no longer mines in the cinders on the back of the tank until he digs up a rusty old link and a couple of pins and, taking these in one hand and his life in the other, sprints down the center of an unballasted track and over unprotected frogs and guard rails 6 inches ahead of a string of cars rolling back at the rate of 15 miles an hour. No; in these days of slavish adherence to M. C. B. standards he just stands around smoking cigarettes and lets the cars couple themselves. No more does he fracture the handle of the fireman's coal hammer and his own peace of mind in vain endeavors to pound a stub switch open after a grilling summer sun has expanded the rails until they are stuck as tight as if they were welded. A fellow in a dog house on a pole away off yonder, by manipulating a few dainty levers, throws the switches for him.

They have replaced the little old eight-wheel engines, with their ear-splitting, staccato bark, with compound steel mountains, with cylinders like hogsheads and nozzles so big that the exhaust is gentle as a lover's whispered nothings, for no better reason than a desire to keep down coal consumption. Trains, instead of being made up of a dozen or so of pill boxes, now consist of a string of warehouses on wheels so long that when the front end is arriving at its destination the hind end is just pulling out at the other end of the division.

No more do engineer and conductor, watches in hand, make nice calculations on the time they can steal to make a meeting point that has a siding long enough to avert the necessity of sawing past. Roads are double-tracked and four-tracked and block-signaled till all a man has to do is to trundle along from block to block until his run is ended and repeat the process until he is retired on a pension.

Ah, no! Railroading isn't what it used to be. But if those Wall street money grubbers had only left us the pay car all else could have been forgiven. Do you remember how, in the good old days, the decrepit jokes about what was to be done when the pay car came were taken out of the moth balls along about the 10th of the month and dusted off and put through their paces? How, toward the 15th, a feeling of sprightliness gradually stole over every one from the wipers in the roundhouse to the lucky dogs who had passenger runs? How this exuberance swelled in volume as anticipation became more keen, until toward the 18th everybody went about with a broad grin and nerves all a-tingle the way you feel when the orchestra is playing the creepy music to accompany the villain's midnight assault with intent to kill? How, still later, everybody drifted down to the depot about four times a day to ask the station agent if he had heard anything about the pay car, until he grew as crabbed as a setting hen? How, about the 22nd, the waiter girls at the Depot Hotel would give you a saucy wink and bring you a great, juicy, melting, extra special wedge of pie you didn't order, for dessert, along with the ice cream and nuts and raisins and fruit and pudding and shortcake you did order? Those girls knew how to work a fellow for tips about pay day, didn't they?

At last, one day as you were letting 'em down the hill into the junction, the operator pulled his train order signal on you. Your heart leaped into your throat because you knew—— Well, you just felt it in your bones. You went down the side of the car without knowing how you did it and sprinted for the switch to

*By C. F. Carter.

head 'em in on the passing track, and then flew to the station on winged feet, leaving the engineer to hold 'em with the driver brakes or let 'em run out at the lower end as he chose. And the grumpy old curmudgeon stopped 'em beautifully, without so much as saying "boo," when on any other occasion he would have unloosed a torrent of vituperation that would have set the ties on fire, and would have followed it up by heaving a monkey-wrench at you if you had been in range.

There behind the counter was the Old Man looking over the shoulder of the operator, who was spelling out the order without breaking oftener than every second word:

"Train No. 7, Conductor Flatwheel, Engineer Poundem, will meet Pay Car special, Conductor Linkenpin, Engineer Moriarty, at Emerson."

Such an air of nonchalance as Old Man Flatwheel did assume as he turned away to discuss with the hind man the advisability of making a switch of that through car of corn next the engine to get it behind the way cars so we wouldn't be bothered with it at Lyons in doing our work on those heavy grades, and affected to forget that he was getting orders until the operator called him over to sign them. He was so slow about his signature that before the despatcher's O.K. was received you looked out of the big bay window and saw the section gang that was working just beyond the Y throw down their shovels and run down the track like a herd of stampeded steers.

There, just coming around the curve, was a glittering vision of brass and varnish half hidden in a nimbus of smoke and dust. Two short blasts on a whistle greeted the gang, the vision hesitated for a minute, while the section men disappeared in the nimbus and reappeared as suddenly as if they had been shot out of a gun, and here came the vision gliding up to the platform with bell ringing and pop valve sputtering *sotto voce*, like a young lady trying to suppress a ticklish cough. It was the pay car. At this point you lost consciousness.

Some time later, while still as one in a dream, you realized that your numbed senses, beginning at the pilot, had taken in every detail of this romantic visitation of opulence. Never was there such an engine as the one which pulled the pay car. At each joint in her jacket was a band of brass 4 in. wide. Dome, sand box, steam chests and cylinders were encased in brass, polished until you could have seen to shave in it. Her front end and her dainty straight stack were rubbed with plumbago until they shone like a small boy's heel. All her bright work was smooth and spotless and glittering, while all the rest of her surface was striped and curlicued with all the colors the general shops could mix.

Moriarity, the lucky runner of this paragon, in a clean checked jumper left open at the neck to show a gorgeous red tie in which a diamond glittered, a hard boiled cady cocked jauntily over his left ear, was lolling out of the cab window in such a way that all the world might see that he wore kid gloves while on his engine. Moriarity was something of a swell and he didn't care who knew it. His only rival in sartorial effulgence was Pete Swanson, his Swede fireman, who was leaning out of his cab window with a stony glare fixed on vacancy, affecting to watch for signals. Of course he knew that all the signals which concerned him would be given with the bell cord; but his zealous attention to duty relieved him of the necessity of recognizing his humbler fellow mortals. No plebeian overclothes eclipsed Pete's glory. There was the square-cut black coat that no one but a railroad man ever wore —you know the kind—a vest of fancy red cloth, trousers with stripes that you could hear ten car-lengths away, square-toed shoes with soles half an inch think, and a stiff-bosomed shirt with red and white stripes. On this foundation reposed a black satin puff tie held together by a locomotive done in gold. On his head at a rakish angle was one of those soft hats of the peculiar block affected exclusively by railroad men a score of years ago. No, you didn't need to read the tag to discover that Pete was a railroad man.

Coupled to the engine was a wheeled palace built on graceful lines in freshly varnished yellow paint which rivaled the brass work on the engine in brilliance. The plate-glass windows were curtained with bright-hued brocade. Not a speck nor a flaw was to be seen. Even the yellow wheels bore only so much dust as had been gathered on the day's run. Through an open window came fragrant odors, while in the background a white jacket surmounted by a black face vibrated at intervals.

All this time Old Man Flatwheel was heading a little procession bound toward the rear platform of the pay car at a gait which he assumed but once a month. Flatwheel had conscientious scruples against undue exertion. He always had the caboose stopped at the station platform so that without dissipating his energies he could saunter in to gas with the agent until the hind man announced that the work was all done and that we were ready to go. Then he would get his orders or a clearance and tell the hind man to give 'em the sign and saunter back to the caboose before they got to rolling. But to have seen the animation with which he swung himself aboard the pay car would have created the impression that he was the only working railroad man on the division.

At his side stalked Panhandle Dan, the engineer, his face actually wreathed in smiles. Panhandle Dan had a chronic grouch from 12.01 a.m. January 1 to 11.59 p.m. December 31, except for three minutes once a month. On the way to the pay car he always perked up a bit and was even known to crack a joke with Old Man Flatwheel. After these two came the hind man talking incessantly with the fireman. Charles always was talking that way. He had an automatic tongue which never ran down. Half the time he didn't know he was talking. His was what the doctors would diagnose as a reflex conversation. Frank, the fireman, was the only sober one. He, poor fellow, was doing sums in mental arithmetic, trying to figure out how on earth $58.60 could be made to pay all necessary bills for a helpless father and mother, a wife and four kids, besides board bills for a man who was obliged to be away from home half the time.

Then there was the operator, in shirt sleeves and careworn air, hoping he could get back to his key before the despatcher lost his temper; the agent, placidly smiling; and the two coal heavers from the coal shed with an expression of almost human intelligence struggling up through numberless strata of grime and whiskers. After 30 days of humping over a scoop shovel in a choking smother of dust they were now about to be recompensed with 30 seconds of bliss in which they could fondle real money with their own hands. After that the storekeeper would do the fondling and feel bad because there wasn't more.

You had presence of mind enough to float into the pay car in the wake of the others. There were nine in the little party and you knew by experience that the average time required to pay nine men was 60 seconds; also that Moriarty would have 'em rolling before the last man had scooped his allotted coin into his trembling palm. But in the presence of death or the paymaster one may live an eternity in 60 seconds. How glad you were that you had not been rude and rushed in ahead of anybody, even the coal heavers! Now your hungry soul could have the uttermost second in which to revel in——

Great Mackerel! Just look at it! A metal coin rack crammed to the muzzle with three denominations of yellow boys, flanked with silver, and on the desk behind it a very large wooden tray on which were long columns of yellow coins. D'ye ever see anything so pretty in all your life? No wonder your eyes stuck out until you could have used 'em for hat pegs. And all the time an exquisitely musical "tinkle, tinkle, clink-clink" welled up from coin rack and counter in response to the calls of the assistant paymaster. Talk about Beethoven's symphonies!

If it were not for that strong wire screen you could have touched that fascinating tray. For the infinitesimal fraction of a second a wicked thought flitted through your brain. Then you almost fainted as your roving eye stared down the barrel of a monstrous revolver. It was only in a rack, but it was within easy reach of the paymaster's hand and most eloquent for all that. Half a dozen of its fellows lay in the handiest places, while as many Winchesters lying on tables and settees, came in strong on the chorus. Hurriedly your vagrant wits busied themselves with all the Sunday-school lessons you had ever learned. As your subconsciousness perceived that the head of the road's secret service department stood on the platform with his eyes intent on every man in the car at once, while Conductor Linkenpin stood on the ground outside very much alert, with his coat tail bulging suggestively, your bosom swelled with pride over the watchful care the company had exercised to bring its honest toilers their hard-earned money.

From the lithograph of Caroline Miskel Hoyt on the wall to the little hollows in the hard mahogany counter worn out by the attrition of the $128,000,000 in wages the paymaster had plunked down on that spot since this first pay car ever built had been commissioned, you kept on absorbing details until your name was called. A still greater rush of blood to your head caused you to gulp violently. Mechanically you lifted your hand to touch the pen as the others had done, and turned to go.

"Here! Come back and get your money."

When you came out of your trance you were standing in the middle of the track, your eyes wandering from some yellow objects in your hand to a nimbus of smoke and dust which was just tipping over the hill to the accompaniment of the diminuendo flutter of Moriarty's exhaust.

But now! Oh, well! After you have washed up on a certain day in each month you trudge drearily down to the station all alone, walk in, and lolling on the counter, affect to look indifferent and say: "Hello, John!" And the agent, after going over a column of figures three times, replies, "Hello, Bill," and gets up and goes to the safe and fumbles over some papers and hands you——

A check! No jokes, no infectious sprightliness, no uncertainty to put a wire edge on anticipation, no fleeting vision of brass and varnish and opulence wreathed in a halo of romance to leave a golden taste in your mouth for a day, nothing but a measly old check handed over a commonplace counter by a man who lives next door to you.

Why couldn't they have left us the pay car?

Increase in Weight of Locomotives.

At the recent annual meeting of the American Society for Testing Materials, H. V. Wille, of the Baldwin Locomotive Works, contributed to the discussion on rails a number of diagrams showing the increase in weight of locomotives of various types during the last 22 years beginning in 1885. Some of these diagrams are reproduced herewith, the weights being the averages of the output of the Baldwin Locomotive Works for each year. Fig. 1 shows the increases in total weight, weight on drivers and average weight per axle for eight-wheel locomotives. It will be seen that the maximum figures were reached in 1904, since which time there has been a decided falling off owing to the practical abandonment of this type of locomotive in favor of Atlantic, Pacific and Prairie locomotives for passenger service on lines of heavy traffic. The highest driving axle loads are 45,000 lbs.

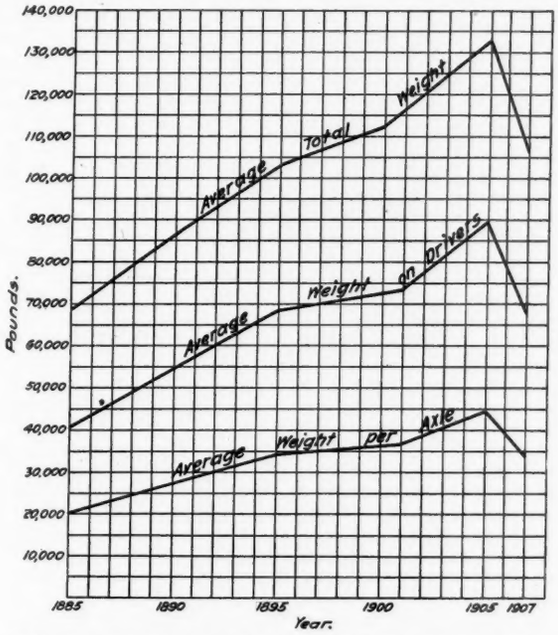


Fig. 1—Increase in Weight of 8-Wheel Locomotives.

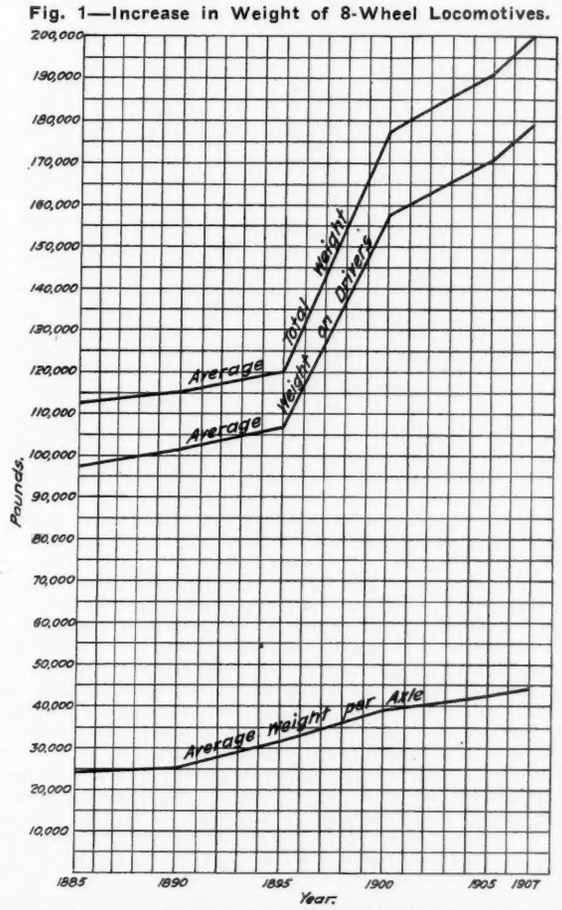


Fig. 3—Increase in Weight of Consolidation Locomotives.

Fig. 2 shows the same data for 10-wheel (4-6-0) locomotives. The average total weight has increased from 87,000 lbs. to 161,000 lbs., or 85 per cent., and the average weight on drivers has increased from 65,000 lbs. to 122,000 lbs., or 88 per cent. The average weight on each driving axle was 21,900 lbs. in 1885 and 40,600 lbs. in 1907.

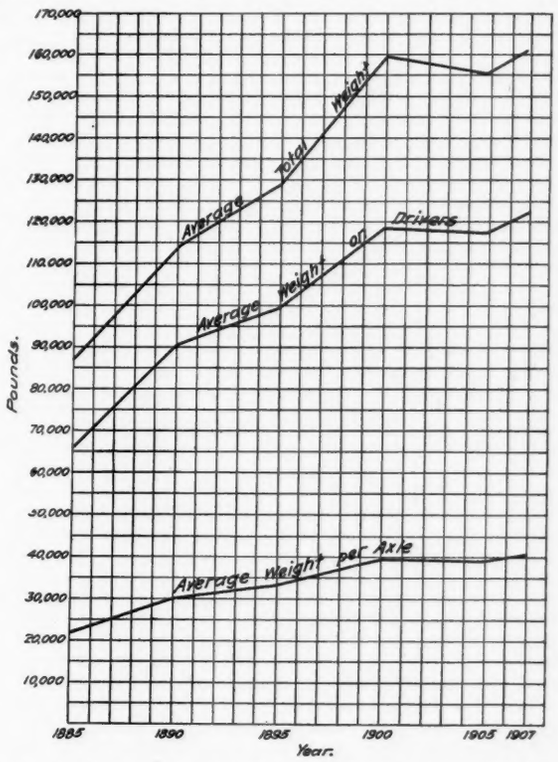


Fig. 2—Increase in Weight of 10-Wheel Locomotives.

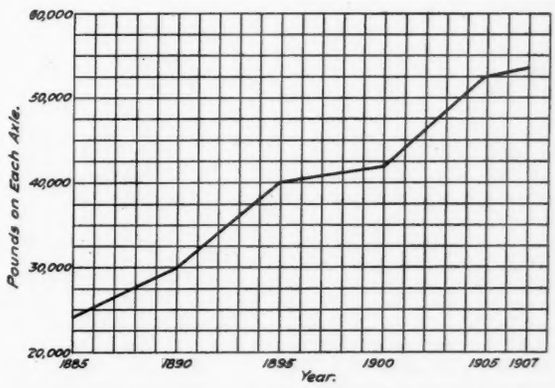


Fig. 4—Increase in Maximum Axle Loads.

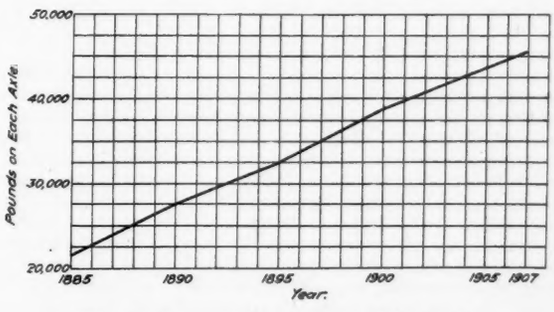


Fig. 5—Increase in Average Axle Loads.

Fig. 3 is for consolidation (2-8-0) locomotives. The average total weight increased from 112,000 lbs. to 200,000 lbs., or 79 per cent., and the average weight on drivers increased from 97,000 lbs. to 179,000 lbs., or 85 per cent. The driving axle weights rose from 24,250 lbs. in 1885 to 44,750 lbs. in 1907.

Fig. 4 shows the increased maximum axle loads, the highest in 1885 being 24,000 lbs. and the highest in 1907 being 53,500 lbs.

The increase is 123 per cent. Fig. 5 shows average axle weights for all types of locomotives, the increase in 22 years being from 21,500 lbs. to 45,500 lbs., or 112 per cent.

New York Telegraphers' Hours-of-Labor Law.

The Governor of New York has just signed a law, passed by the last legislature, to limit the working hours of railroad telegraph operators. The law is in substance as follows:

It shall be unlawful to require or permit any telegraph or telephone operator who spaces trains by the use of the telegraph or telephone under the "block system" * * * or whose duties pertain to the movement of trains by the use of the telegraph or telephone * * * to be on duty for more than eight hours in a day of 24 hours, except in cases of extraordinary emergency caused by accident, fire, flood or danger to life or property; and for each hour of labor so performed in any one day in excess of such eight hours, by any such employee, he shall be paid in addition at least one-eighth of his daily compensation. Penalty not less than $100 or more, one-half to go to the informer. The provisions of this act shall not apply to any part of a railroad where not more than eight regular passenger trains in 24 hours pass each way; provided, moreover, that where 20 freight trains pass each way generally in each 24 hours then the provisions of this act shall apply, notwithstanding that there may pass a less number of passenger trains than hereinbefore set forth, namely, eight. The act takes effect October 1, 1907.

Three Cent Fares in Cleveland; A Favorable View of Mayor Johnson's Projects.*

The fight for lower fares in Cleveland dates from 1898, when ordinances were introduced in the City Council to reduce fares on certain lines. These ordinances proceeded on the theory that the right to regulate fares and service had been reserved to the Council. In the elections which preceded these ordinances the political activity of the railroad companies had been notorious, and the use of money to influence the elections and to control councilmen was a matter of common gossip and scandal. The street railway companies met these ordinances with injunction suits. Thus began the first of a long line of litigation, which has extended over the intervening eight years, and which has been fought through every state and federal court. In the meantime grants were nearing expiration. Two considerable main line grants expired in 1905. This has been decided by the United States Supreme Court. Other grants, covering the very backbone of the system, will expire in from one to three years. On two occasions the railroad company nearly succeeded in getting a renewal grant. If it had made an offer even approaching the one it is now making, nothing could have stopped the passage of the renewal ordinance. But the City Council, realizing that there was little hope of being able to regulate fares under the old franchises, sought to secure a reduction and readjustment by inviting competition.

In 1901, Tom L. Johnson, millionaire, successful street railway promoter and operator, became Mayor, and thus brought to the service of the city a type of ability ordinarily to be found only in private corporations. He was elected after a campaign in which the street railway question was the chief issue. His efforts induced an outside capitalist to offer to build street railway lines and operate them on a 3-cent fare. The preliminary legislation was started and in 1902 grants were made to a competing company at 3-cent fare over territory not yet pre-empted by the old company. A new line of litigation and injunctions was begun and, because the railways themselves had hitherto made most of the street railway law, this new company was finally forced out of business.

At once new establishing ordinances were introduced, in which all of the quirks and technicalities were complied with to their last absurdity. And so dangerous to the "vested interests" did this attack become that the co-operation of the Attorney-General of the state was secured, and suit brought in the Supreme Court of the state to oust the city government and declare void its charter. The end to which the Cleveland roads, under the leadership of the late Senator Hanna, went in this litigation is almost without a parallel. The company, to maintain its advantage, succeeded in destroying not only the charter and city government of Cleveland, but brought down every city government in the state, so that not one charter was left whole. The destruction of the charters throughout the state made it necessary to hold a special session of the legislature in order to supply a new municipal code. On the night of May 4, 1903, this new code, under which all cities of Ohio are governed, went into effect, and the same night the fight was renewed. New establishing ordinances were again introduced.

Under these ordinances the Forest City Railway was awarded one grant on an outlying street for a 3-cent fare road. With this as a base to extend from, there has now been built and equipped, during intervals between injunctions, a 15-mile piece of road, from one extremity of the city to the center. It will be well to explain here that, under the laws of Ohio, it is almost impossible to establish a new line, but a comparatively much easier matter to extend from an established line. In the meantime construction has commenced on isolated stretches on the other side of the city. An extension over the two main lines of the old company, the franchises for which have expired, has been granted to the Forest City Railway. When all of these pieces are connected, there will be a line from one extreme end to another through the very heart of the city. As the old franchises expire, the new company will bid for franchises over these streets on the same terms hereinafter explained. Thirteen miles of the new road have for several weeks been in actual operation, and experts who have studied the matter claim that this fragment, by itself, can be operated for 3-cent fares at a profit.

The new road is being built and equipped for less than $50,000 per mile. The capitalization of the old company is $150,000 per mile. The construction is of the most modern and heaviest kind, and the equipment the best to be had. As a matter of fact, the structural value of the 236 miles of the old company is under $50,000 per mile, although capitalized for three times this amount. This figure was at one time agreed to by the old company. The capital invested in the new project is represented by the Forest City Railway, which is the owning company. The city is represented by the Municipal Traction Company, which is the holding company. The Forest City Railway is a corporation organized in Ohio, with a present authorized capital of $2,000,000, all common stock, 6 per cent., cumulative. It can issue no bonds. Under a trust agreement, $1,900,000 of the stock has been turned over to one of the leading trust companies of the city, the largest in the state. The other $100,000 of the stock had already been issued for actual money paid in. By a fiction of purchasing franchises from the original grantee for $200,000, the stock is fully paid up when sold at 90. Of it $750,000 was offered at popular subscription and oversubscribed by nearly an equal amount. The stock may be retired at 110. The money from the sale of stock at 90 can only be paid out by the trust company, on the order of the Municipal Traction Company for actual construction cost and expenses incident thereto, and for payment of 6 per cent. interest on instalments paid in to the first day of October, 1906, after which date dividends accrue. We have here a corporation without a dollar of debt, in which every stockholder, no matter at which time he becomes one, is on exactly the same footing, and one in which every dollar paid in goes into construction. There is no ground floor, no "rake-off" for promoters.

The franchises are all granted to The Forest City Railway. They are for 3-cent fare, cash or ticket, and universal transfers. The right to regulate charges and service is explicitly reserved to the Council. The grants are revocable at the will of the Council, limited only by a clause that the property cannot be impaired as a 6 per cent. investment. They contain a municipal ownership clause, under which the city may, whenever the laws of Ohio shall permit it, take over the property for its actual cost, less depreciation, plus 20 per cent. All of the property and rights, present or to be acquired, of the Forest City Railway are leased to the Municipal Traction Company for 50 years, with a privilege in the lessee to renew for another 50 years. The lease follows the general scheme under which the Elkins-Widener Syndicate controls the underlying properties in its system of street railways.

The Municipal Traction Company can be described as a purely paper corporation. It is organized under the laws of Ohio with an authorized capital of $10,000, 10 per cent. paid in. It is composed of five selected stockholders, each one a director, each owning one-fifth of the capital stock. Its personnel consists of five leading business and professional men, the President and General Manager being A. B. du Pont, one of the leading street railway experts in this country, and its Vice-President, Frederick C. Howe, a law partner of James R. Garfield. It will never pay any dividends. The directors and officers get reasonable salaries. By a carefully drawn contract, each stockholder and director has executed to all of the others an option on his stock, under which it will only be necessary to insert the name of the newly elected director into the certificate to transfer the stock. The stock certificates have been endorsed in blank and put in safe deposit and are accessible only to a majority of any surviving members. If a vacancy should occur, the same will be filled by the survivors. If the directorates shall all become vacant at the same time, a court of equity would take care of the emergency. The body is thus self-perpetuating.

The Municipal Traction Company owns no property except the lease to it of the Forest City Railway. It has or assumes no liabilities other than the current ones growing out of the operation of the road and the rental equal to 6 per cent. on the outstanding stock of the Forest City Railway and not to exceed $2,500 per year organization expense. Under the terms of the lease the lessee constructs and equips the road out of the proceeds from the lessor company's stock, and the title to the property is in the lessor. The

*Abstract of an article by Carl H. Nau, in the *Journal of Accountancy.*

lessee operates and maintains and keeps in original good repair the property of the lessor out of the earnings from operation. The lessor company cannot issue bonds, execute any mortgage or make any charge upon its lines or property without the written consent of the lessee. The lessee, of course, cannot in any way put any charge upon the property, the title to all of which is vested in the lessor. The lessee can, out of its surplus earnings, buy the property of the lessor at any time, in whole or in part, for a price 10 per cent. in excess of part on the stock, and the rental to be paid ceases on such portions so bought. Any portion of the property so paid for out of earnings, or any extensions to it built out of earnings, will not have to be paid for when the city exercises its option to purchase under the municipal ownership clause in the franchise. All of the books and records of both companies are open to the inspection of the City Council or any citizen, and the utmost publicity has been provided for concerning all of their transactions.

The crux of the holding company plan is the question of trusting the five directors of the Municipal Traction Company to administer their trust faithfully and to elect equally faithful successors. As already shown, the stock of the Municipal Traction Company is so safeguarded that none of it can pass into the estate of a director in case of death, nor into the hands of a receiver in bankruptcy in case of financial trouble. All vacancies will be filled by the surviving members. The efficient checks upon the good faith and rectitude of the five men composing this holding company for the public are:

1. Their high character, the public pledges they have given and the obligations they have assumed.

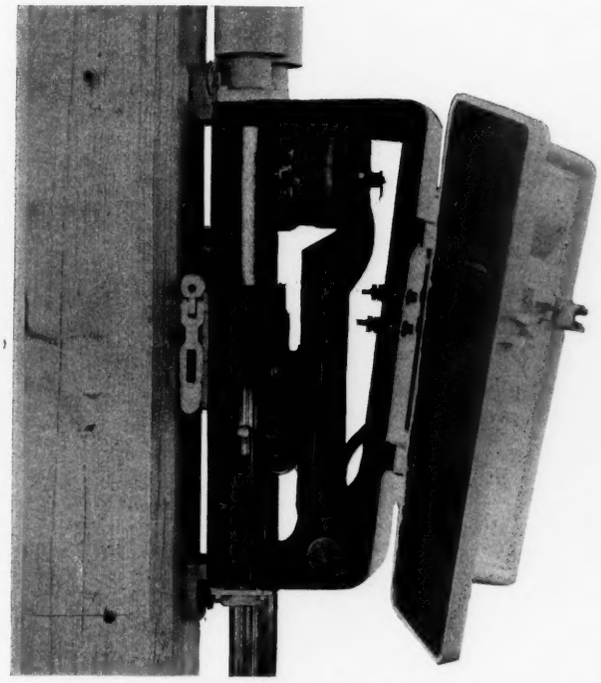


Fig. 1—Double Electro-Mechanical Slot.—Doors Open on Both Sides.

2. The utmost publicity. They and their every act are at all times open to public scrutiny.

3. The city's right, under the option reserved in the franchises, to appropriate the property at a small percentage over structural value.

4. The right to revoke the franchises at any time and grant them to another, who will compensate the stockholders of the owning company for their actual investment only.

Since this new project was financed and the holding company formed, the old company has made a new offer, which for the past six months it has been strenuously urging on the city by the expenditure of over $1,000 a day in advertising in the newspapers and by the attempted creation of favorable sentiment through discussions in churches, clubs and other organizations of the city.

This offer for a renewal franchise for 20 years is seven tickets for a quarter and universal transfers, including all of the other burdens now imposed, such as paving, sprinkling, licenses, etc. The present rate is 11 tickets for 50 cents. In its advertisements the company claims that this means a saving to its patrons of over $1,000,000 a year.

The fight for 3-cent fares in Cleveland has now, however, progressed so far that there seems to be a growing disposition to compromise on nothing less, and moreover to insist on no franchise being granted, at any rate of fare, that is not revocable and that does not reserve the future to the city. As the most valuable franchises expire in a comparatively short time, the disposition seems to be to wait until they do expire, and then grant them to the Forest City Railway. In the meantime, a truce has been entered into whereby all construction by the new company and all adverse activities and litigation by the old company has been stopped, while a representative of the city and one of the company are fixing the value of the old company's property, with a view to leasing it to a holding company controlled by the city. The basis for the leasing value is to be physical value, plus unexpired franchise value, plus one-ninth.

The Hall Electric Slot.

The Hall Signal Company's electro-mechanical slot for semaphore signals combines in a marked degree reliability, simplicity and accessibility. To reduce failures to a minimum such an apparatus should be easily understood, and easy to inspect and repair. A slot placed at or near the arm of a high signal is not, under the most favorable circumstances, easy of access. A small case, necessitating excessive compactness aggravates this condition. The placing of moving parts, such as levers and dogs, behind any other part, necessitating the removal of the latter to make repairs to the former, is a nuisance, and wires connected to moving magnets are liable to cause failure. This slot, shown in the accompanying illustration, is free, to a remarkable extent, from the evils mentioned. It is designed to be mounted near the base of the signal post, where it will be easily accessible to the maintainer. All movable parts can be plainly seen and easily inspected or removed without dismembering the entire mechanism. The case is roomy but not over large, and the magnet is fixed. The details and construction are shown in Fig. 2. In this drawing A represents the cast-iron case; B is the lower operating rod and C the upper operating rod carrying the dash pot Q, attached in the usual way. D is a powerful iron-clad magnet mounted on a stand which is rigidly fastened to the case; E is the armature secured loosely to the lever F by the threaded pin G. G is slightly smaller than the hole in F, through which it passes, and has a semi-spherical head, after the manner of a ball and socket joint. This is to allow E to make good contact with D despite any small lack of adjustment in F. Lever F is pivoted at O. H is a phosphor bronze spring used to restore lever F to its normal position, but exerts no appreciable pressure otherwise. I is a cast-iron sleeve riveted to the lower rod B, and carries the latch J pivoted to the lug K, which is part of the sleeve I; J carries a roller L to reduce friction when traveling against lever F. The lower end of C extends within B and carries a pin M working in slot N cut in B. This is to allow the signal to be pulled to danger, as M projects beyond the edge of B on both sides. Both rods are notched at P to allow the projection of latch J to engage with upper rod C.

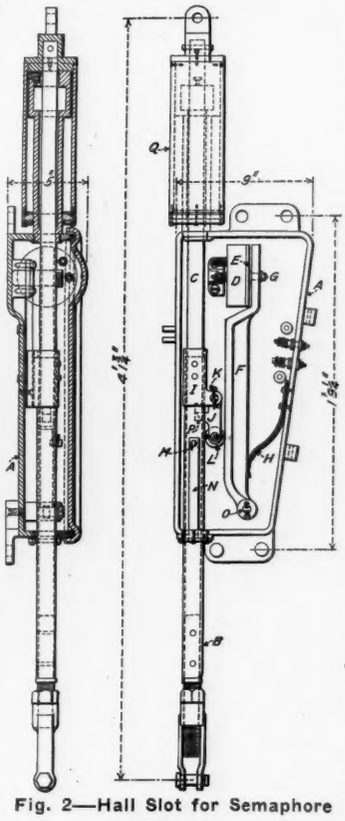


Fig. 2—Hall Slot for Semaphore Signal.

When the magnet D is energized the signal can be cleared. The magnet holds F against latch J by pressing against roller L, and then if B is raised C must also go up for latch J will engage with lower end of C. If, while the signal is in the clear position, magnet D becomes de-energized, as by the opening of a track relay, the weight of the spectacle acting against lever F, through C and latch J will force F away from D; and J, in tripping, will allow C to pass by, and the signal will assume the stop position.

When F is forced away from D it compresses spring H, which remains compressed until B has been restored by the signalman to its normal position, allowing J again to enter the notch P; when this occurs H restores F to contact with D. If it is attempted to clear the signal when D is de-energized, F will be forced back in the same manner as above described.

The double slot, shown in Fig. 1, is used where two arms of

a signal are slotted, and is much more compact and convenient than two single slots. This slot consists essentially of the mechanisms of two single slots mounted side by side in one case, and it operates exactly as above described. The principal dimensions of both slots are shown in Fig. 2. The single slot weighs approximately 85 lbs., and the double slot approximately 145 lbs. These slots will operate on 0.12 watts, and are highly efficient.

The Chemical Composition of Steel Rails.*

In the discussion on a paper which I presented to the institution nearly 40 years ago, manufacturers suggested matters of specification and composition in connection with rails should be left entirely to them; but the late Sir John Fowler, past-president, upheld the claims of his profession, and stated that "in his opinion it was not desirable in the interests of railroad proprietors or the public that engineers should abdicate their functions; but he would advise them to draw up specifications and to take pains to ascertain the process of manufacture. However, he thought it would be admitted that no rule could be laid down for the manufacture of rails which would be applicable to all localities."

In spite of the great amount of subsequent study, and of discussions on this subject, I still retain my opinion that a universal specification or composition for rails which would suit all cases cannot be satisfactorily arrived at. The varying conditions, such as ores available, process of manufacture, weight of rail, climatic and traffic conditions, differ in almost every case and all of them should be taken into account, in order to obtain the best results.

It will easily be realized how difficult a problem faced the Engineering Standards Committee when drawing up a general specification with fixed limits of chemical composition, to be applicable to the various processes of manufacture and other conditions.

All I can do in introducing this subject is briefly to mention the effect of each element according to my experience.

Beginning with phosphorus, I think engineers have suffered enough from fractures due to a high percentage of this element, especially in cold climates, to make it necessary to limit it as far as possible, in spite of the good wearing results of high-phosphorus rails. It is possible to work to a lower phosphorus limit with the basic than with the acid processes, especially with the basic open-hearth process; but starting with a pure ore, as in the acid processes, must always be attended by less risk of an accidentally high-phosphorus than the basic processes of purification.

Sulphur will probably present more trouble to the manufacturer than to the user, because if a high percentage is present the rails will be red-short. Sulphur is also liable to cause incipient flaws, which, although not apparent at the rolling, may develop under continuous wear into serious flaws, and in the interests of both the manufacturer and the railroad excessive sulphur should be avoided.

Manganese was stated by the late Sir William Siemens to have the effect of atoning for many evils in steel by healing it up and producing a smoothly rolled surface, which, after all, is of great importance, as many fractures commence with a small surface crack or flaw. At the same time, no more manganese should be allowed than is absolutely necessary for clean rolling, as I have found many cases of rail-fractures attributable chiefly to high manganese.

Silicon.—It has been found in the past that rails containing a high percentage of silicon, although giving excellent wearing results, have not been satisfactory, owing to their brittleness and irregularity of percentage. This has been due to the silicon being left in the steel from the pig-iron during the conversion, or added in the form of pig-iron. As a result of this experience, engineers now generally limit the maximum percentage of silicon to 0.1 per cent. or even less. I have for many years experimented with silicon in rails with a view to obtaining soundness and solidity without brittleness, and I gave some results of my experiments in a paper read before the Institution of Mechanical Engineers in Sheffield, in 1890.

I have found that for rail-steel the effect of silicon added is very different from the effect of silicon left in from the pig iron. When silicon is left in, the percentage varies considerably, depending on the heat of the charge, thus causing great irregularity, and as the iron has not been completely converted into steel the metal is of a brittle character. As a rule silicon, if left in, is an indication that the metal has been blown too hot, which is well known to lead to great irregularity in the finished steel. But when the silicon from the pig-iron has been eliminated as far as possible and a known quantity of silicon is added, in the form of high-percentage silico-spiegel or ferro-silicon, I obtain regularity in the percentage of silicon, and moreover, the silicon then toughens the steel instead of making it brittle, this being largely due to the more complete removal of gases and oxide from the steel. I thus obtain a harder, and at the same time, tougher rail, which as far as mechanical tests indicate should be able better to withstand both the wear and the crushing at the ends caused by the present day heavy axle loads. Very thorough tests on large quantities of these rails have been made at various works, but tests, although of great interest, could not be taken as final until they were confirmed by actual experience in the road. I have laid this question before many engineers who have witnessed the tests at the works, and who have now had the rails in the road for some time, and I think it would be of general interest if some of them would give their experience as far as it goes.

Carbon.—In general it is desired to obtain a rail as hard as is compatible with safety, and carbon is the most suitable hardener. In my practice I do not specify carbon limits, merely stating that it shall be as high as the safety or drop-test will allow. Although not absolutely a criterion, the drop-test is still the best safety-test we have.

Another point that has of late years attracted considerable attention is the modern high speed and temperature of rolling. Efforts have been made by various means to remedy the evil effects of this, such as using larger ingots, allowing the whole rail to cool before the last pass and other methods. I have preferred to obtain cold rolling of the rail-head only, by applying sprays of water to this portion of the partially rolled rail at the various passes of the rolls. This should at any rate improve the wearing surface, and has the advantage of neither delaying the manufacture, decreasing the output, nor appreciably increasing the cost. The rails of which tests are shown in a table (to be exhibited at the meeting) have all been treated in this way.

Considerable trouble has been experienced on electrified railways owing to the excessive side wear of the rails on curves. Apart from the question of better wearing steel for their rails in general, one of these railways has introduced the novelty of using a considerably harder steel for check-rails. This has shown surprisingly good results, about which I hope we shall hear more during the discussion.

Regarding special qualities of steel, such as manganese, nickel or chrome-steel rails, I have not, in the short time now at my disposal, touched upon these, because, owing to their high price they can generally be employed only for exceptional purposes.

*A paper read before the Engineering Conference of the Institution of Civil Engineers by Christer Peter Sandberg.

Local Freight Agents' Association.

The annual meeting of the American Association of Local Freight Agents' Associations was held at New Orleans June 18, 19 and 20, representatives being present from 60 cities. Membership in this association consists of Local Freight Agents' Associations located in cities of the United States and Canada having 50,000 inhabitants or over with three railroads, 100,000 inhabitants or over with two railroads or any city with five railroads, and the American association is formed of such associations situated in 86 of the largest cities of the United States and Canada. The topics discussed at this association are labeled with the name of the city which presents them at the meeting. We give below a condensed statement of the most important business done at New Orleans.

Stray freight was discussed in communications from three different cities, and it was voted the sense of the meeting that stray freight should be forwarded to the marked destination by the shortest route, billed free, the agent at destination to see that the roads interested receive their proper share of the revenue.

Toledo presented a paper written by C. H. Newton, formerly Local Freight Agent but now Freight Claim Agent of the Wabash, on the necessity of loading cars to their full capacity; and the meeting voted to have 10,000 copies of the paper printed. Kansas City proposed that waybills of freight received should remain permanently in the hands of the receiving agent and the matter will be taken up with the Accounting Officers' Association. Louisville proposed and the association agreed that freight houses ought to be closed from 12 noon to 1 p.m.

On the suggestion of St. Louis it was the unanimous opinion that one complete file of tariffs should be kept at each station, and only one; this to be the working file of the office, and to be accessible to the public.

Peoria.—The conference committee was instructed to try to secure the adoption of rules under which detachable parts of traction engines, agricultural implements and such like freight, when carried on open cars, should either be boxed or be fastened to the car by iron bands or bolts.

On the suggestion of Memphis a committee of five was appointed to draft a set of uniform blanks for use in local office business.

Cleveland.—In view of the great difficulty experienced in getting competent office help, every railroad should have an officer to be in immediate charge of agencies, keeping in close touch with their wants.

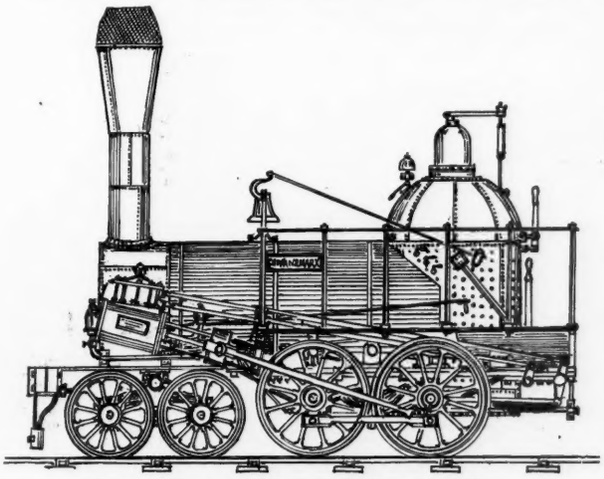
The President of the association for the ensuing year is W. W. Alexander, Louisville & Nashville, Cincinnati, Ohio; Secretary, G. W. Dennison, Pennsylvania and Hocking Valley, Toledo, Ohio. The place and time for the next meeting will be decided by the executive committee.

Early Years of the Philadelphia & Reading.

BY C. H. CARUTHERS.

The desire of the people of England to provide a speedy means of carrying coal from the mines to the more distant points of consumption or distribution formed the primary incentive to building railroads at the time of their origin in that country, and to the same motive can be attributed the construction of the Philadelphia & Reading Railroad, one of the busiest railroads, not of Pennsylvania alone, but of the whole United States.

Tiring of the slow and somewhat uncertain methods of bringing



Freight Engine "Gowan & Marx," 1839.

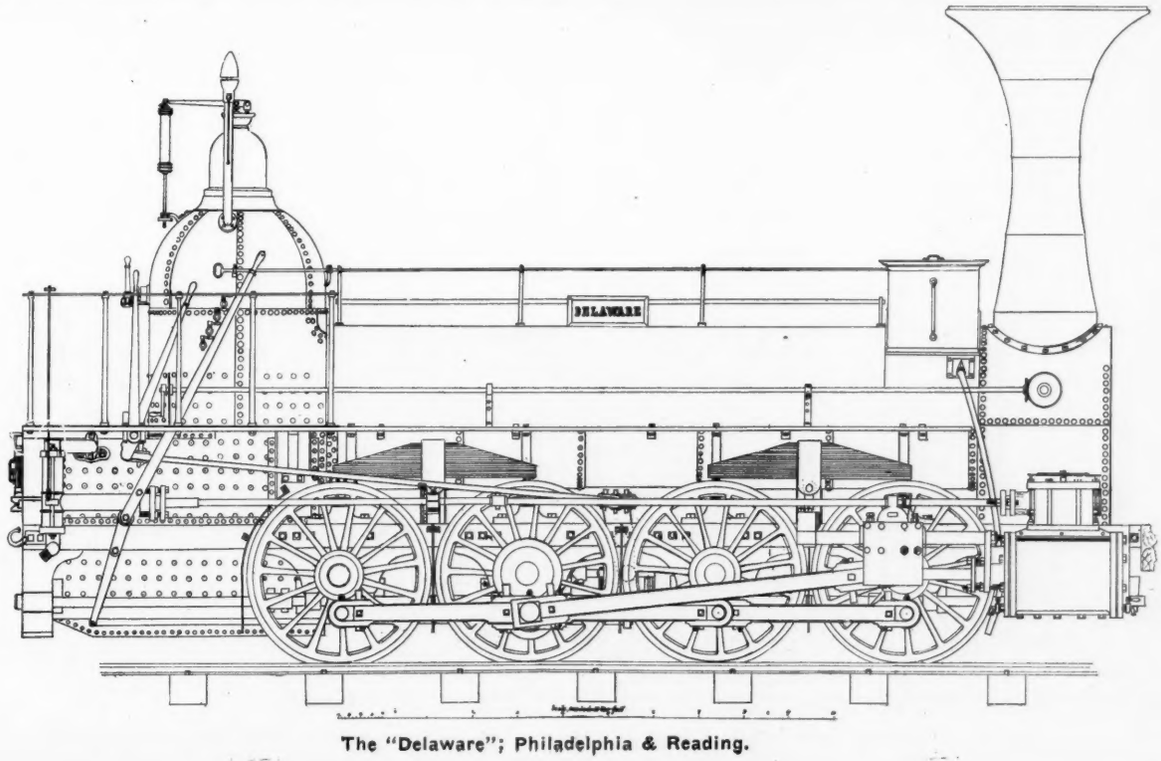
Built by Eastwick & Harris. Fuel, anthracite coal. Cylinders, 12½x18 in. Drivers, 42 in. Weight, 11 tons. Weight on drivers, 9 tons. Gurney draft box.

to market the products of the vast deposits of coal in the anthracite regions of Pennsylvania, the promoters of this road built it from Philadelphia to Port Carbon and Pottsville, passing, of course, through Norristown and Reading. Thus, although much of the line was located in fine agricultural districts and passed through manufacturing towns of considerable importance, even at that early day, the chief object in view was the heart of the anthracite coal regions of the state.

The first part of the road to be completed extended from Reading to Norristown, and the first train was run over it on July 16, 1838, when 11-ton engine, "Gowan & Marx," burning anthracite coal, drew a train between the points just named. This train, according to the company's report for the year 1838, consisted of 80 small four-wheel cars containing 1,635 lbs. of flour, 73¼ tons of blooms, 6 tons of coal, "2 hhds. of whisky and other articles" and 60 persons. The total weight of the train, exclusive of engine and tender, was 368 tons, or a net weight of 240 tons. The figures and arrangement of items are exactly as embodied in the report. After the train had covered a distance of 12 miles from Reading, the "water pipes" (by which the official who compiled the report probably meant the pipes connected with the pump) gave out and caused a delay until engine "Delaware," the Winan's "crab" of that name) came up and pushed the outfit to Pottstown. Here the trouble appears to have been rectified, and the "Gowan & Marx" drew her train the remainder of the distance to Norristown, "assisted at a few points by second-class engine 'Neversink.'" The weight of the "Delaware" is stated to have been "10 tons, including water and fuel." Passenger traffic between Reading and Pottsville was established soon afterward, and also between these points and Harrisburg by way of the Schuylkill Valley and the state road of Pennsylvania. The freight traffic, however, was small, but was not expected to be otherwise until the entire line would be ready for operation from Port Carbon to Philadelphia. This important event took place on January 13, 1842, and hauling of anthracite coal by rail then began in earnest. The cost of the road is placed at $5,000,000, with an additional $521,000 for the extensions to Pottsville, and from the Philadelphia terminus to the Delaware river. As an indication of the business done after the final opening, the report for 1842 shows that the company at that time owned 12 eight-wheel passenger cars, 2 four-wheel passenger cars, 1,130 four-wheel coal cars, 176 four-wheel freight cars, 3 eight-wheel freight cars and 5 four-wheel baggage cars. It is most probable that the capacity of these four-wheel freight and coal cars was little, if any, over three tons. Contracts had also been entered at this time for 14 locomotives and 450 four-wheel coal cars.

From this beginning of 96.9 miles of road, the company from time to time absorbed the following lines: Atlantic City Railroad; Catasauqua & Fogelsville; Cape May, Delaware Bay & Sewells Point; Chester & Delaware River; Dauphin & Susquehanna; Gettysburg & Harrisburg; Lebanon Valley; Middletown & Hummelstown; Mine Hill & Schuylkill Haven; North Pennsylvania; Perkiomen; Philadelphia & Chester Valley; Philadelphia & Frankford; Philadelphia, Newtown & New York; Port Reading; Philadelphia, Germantown & Norristown; Reading & Columbia; Rupert & Bloomsburg; St. Clair, Tamaqua & Hazelton, and Wilmington & Northern. It also added a line of sea-going steamships, sailing from its Port Richmond wharves and carrying anthracite coal to many seaports.

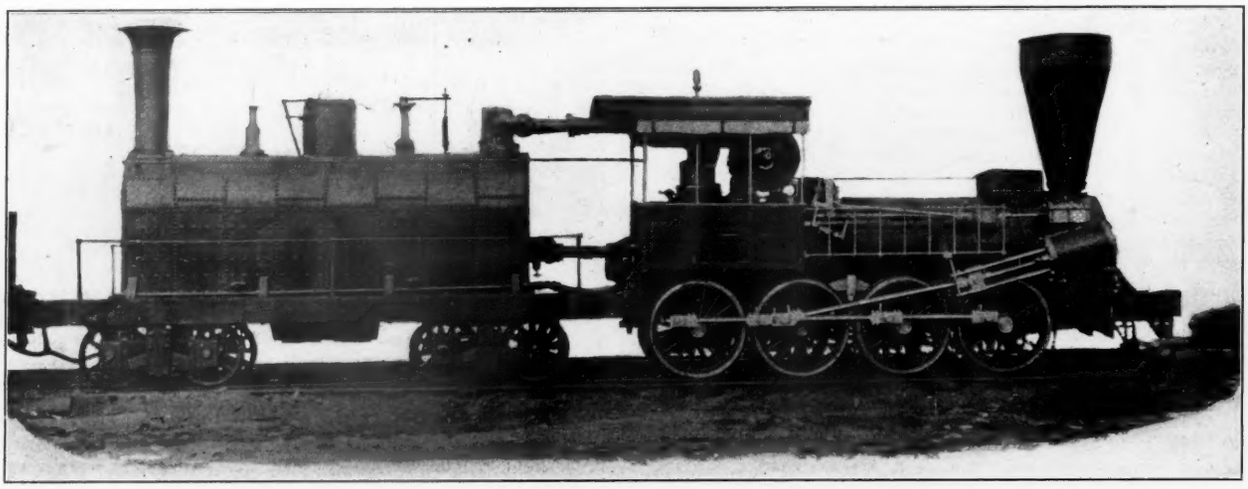
In the few years which intervened between the phenomenal success of the "Rocket" at Rainhill and the date of the opening of the Philadelphia & Reading Railroad, the steam locomotive had so thoroughly established the claims of its supporters as the only satisfactory means of drawing railway trains (excepting, of course, the use of stationary engines on inclines of unusually heavy grades) that no allusion appears in any of the printed matter consulted in



The "Delaware"; Philadelphia & Reading.

connection with this article to indicate that any other method had been considered.

It is probable that the "Gowan & Marx" and the Winans' "crabs" were the only engines of the early equipment which used anthracite coal as their fuel, and that on account of the abundance of wood then available at low prices, together with the limited grate area of the other engines, the use of anthracite in them was not attempted to any extent. Naturally, however, the officers of the company realized the importance of using in all their locomotives a fuel with which the interests of the company were so closely allied. The "Gowan & Marx" already referred to had a firebox 60 in. long, and the large grate surface in comparison to that of their other engines

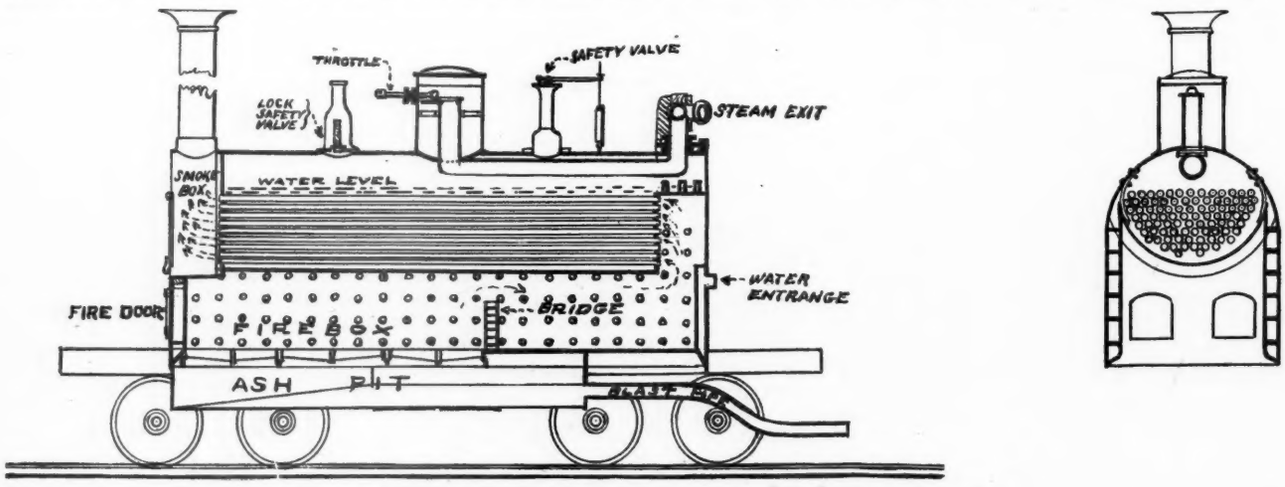


Engine "Novelty", Built in 1847 at Reading, Pa., from Designs of G. W. Nicholls, Engineer and Master Mechanic.

undoubtedly produced results which impressed both officials and locomotive builders with the necessity of large grate era in engines using anthracite coal. Even with this engine the desired degree of efficiency in the use of fuel does not seem to have been obtained; in fact, the solution of the problem appeared rather remote until 1846, when Ross Winans placed his engine "Baltimore" on the road. The firebox of this engine had a grate area of 17 sq. ft. It also had a variable exhaust which proved satisfactory, and the favorable results obtained from this engine doubtless induced the designing and building of the "Novelty" in the following year, with a grate surface of about 44 sq. ft. In 1850 Ross Winans delivered the "camel" engine "Patapsco" to the road, with a firebox of 19½ sq. ft. grate area, and in 1852 James Millholland brought out his "Pawnee," with a grate surface of 24½ sq. ft., following it with the passenger engine "Hiawatha," which also had a grate surface of 24½ sq. ft. These last three engines were practically the standard engines of the road during the next ten years, or until about 1862, when freight engines of the "gunboat" type and passenger engines with similar boilers were built. Both of these types were larger than their predecessors, and both had a greater grate area. During the ensuing fifteen years but little change was made in the locomotive practice of the company. Then, in 1877, the first Wootten boiler was applied to an engine numbered 408. This engine was exhibited at the Paris Exposition the following year. The Wootten boiler at once became the standard on the line, and with some modifications has not only continued to be so ever since, but has also been extensively adopted on other roads using anthracite coal in their engines, and in a few instances has been applied to a number of engines on roads where soft coke coal is used.

As we have already referred to the fact that the Reading Railroad was built and opened but a few years after the "Rocket's" achievements in Europe, and the impetus given to locomotive construction in this country by the final successful operation of M. W. Baldwin's "Old Ironsides" on the Philadelphia, Germantown & Norristown Railroad, therefore it is but a natural sequence that we should find a great variety of types of locomotives on the road in the earlier years of its existence, especially when we consider that American builders soon cut away from the somewhat similar designs of the various English builders, and each man became "a law unto himself" in his efforts to improve the design and efficiency of the steam locomotive. The English engines in use were all practically of the "Planet" type, which will be recognized by those who have seen the famous "John Bull," now in the National Museum at Washington, D. C. Among the earlier engines were four Winan's "crabs," of which the men running them in 1840 say: "They are pulling like elephants."

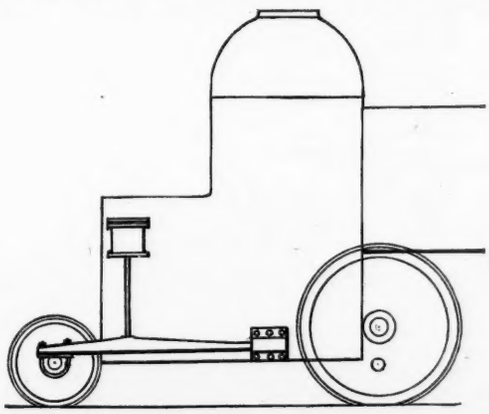
As tabulated data of the engines does not appear in the company's reports until 1846, it is possible that some very interesting machines have passed out of existence and "left no trace behind." These reports show that in 1845 the company owned equipment consisting of 47 locomotives, 2,456 four-wheel coal cars, 265 four-wheel freight cars and 19 passenger and baggage cars. The names of the firms which built the locomotives are: Braithwaite & Co. (England); M. W. Baldwin; Norris Brothers; Eastwick & Harrison, Locks, Canal & Navigation Co.; Lowell Machine Co.; Dotterer & Co., and Ross Winans. By the close of 1847 the locomotive equipment had increased to 72, and the annual report for 1857, ten year later, gives a total of 141. In the report for 1872 we find the names Boston Locomotive Works (Hinckley & Drury); Hayward, Bartlett & Co.; John Brandt; Taunton Locomotive Works; Davenport, Bridges &



Side and End Views, Engine "Novelty", 1847; Philadelphia & Reading.

Kirk; Danforth, Cooke & Co., and Reading Railroad Co. added to the list of builders for the road.

Until 1872 all the engines were known by names, but in that year numbers were substituted, although the annual report of that



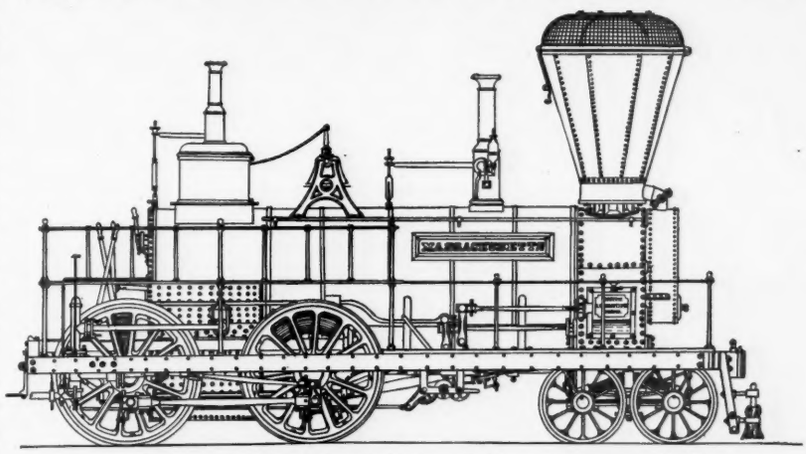
Trailing Wheels and Connections Added to Winan's Locomotives of 1847.

date gives both names and numbers in the tabulated statements of the locomotives, which had then reached a total of 377. All subsequent reports use numbers only. That of 1879, which practically marks the advent of the more modern types of engines on the road, places the total number at 495, and contains the name of one more builder, Smith & Jackson, in addition to those of 1857.

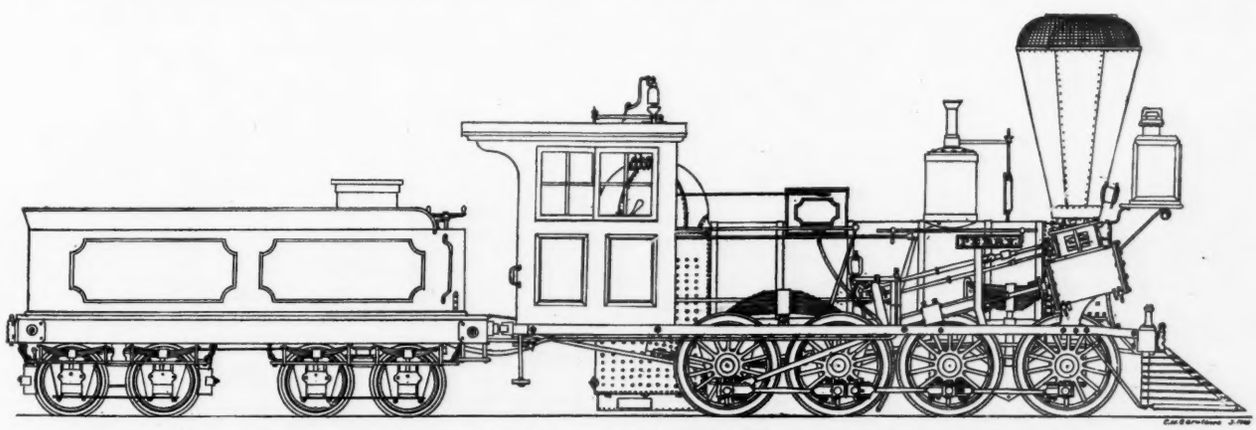
Referring to some of the more prominent types of engines used at various times on the road, the "Gowan & Marx" first attracts our attention. This machine was built by Eastwick & Harrison, of Philadelphia, Pa., and its prominent features, in addition to the large grate surface already alluded to, are the position of the wheels, which were placed in such a manner as to allow the drivers to carry 9 of the 11 tons of its maximum weight, and its reversing valve-seat, which was placed upon the regular seat, carried the slide-valve on its back, and contained ports which regulated the admission and exhaust for forward or backward motion as it was moved backward or forward. On first examination of a drawing of the "Gowan & Marx" one would suppose it to be one of the "old-timers," with full-stroke and cut-off valve-rods, but the preceding description of the reversing-plate will make it clear that the lower rod controls this plate, while the upper one is that which actuates the ordinary slide-valve. The cylinders were 12½ by 18 in., and the four driving-wheels were 42 in. diameter. The forward end was carried on a four-wheel truck. A peculiar form of nozzle, or exhaust-box, was used; the invention of Eastwick & Harrison. This consisted of a sort of drum which the exhaust steam entered on the under side and emerged through a large number of small tubes on the top. This arrangement was supposed to have a more continuous and uniform effect on the fire than the common form of nozzle, and was used on a number of engines built by the same firm for other roads.

Of the English engines on the road at that time the "Spitfire" was afterward sold to the Delaware, Lackawanna & Western, and became the No. 1 of that road. It, like its sister engines, was from the shops of Braithwaite & Co., and was of the "Planet" type. A six-wheel connected engine, without truck wheels, named "Richmond," was built and placed in service by Norris Brothers in 1844, but exploded its boiler not long afterward. It was afterward rebuilt by the railroad company and its name changed to "Philadelphia."

The Ross Winans engine "Baltimore" of 1846 required some changes in the way of looping off a part of the cylinder flanges at the sides, and a slight readjustment of some other parts to enable it to clear all objects along the line before it was permitted to go into service. A man who was at that time, or nearly afterward, connected with the motive power department of the road, informed me some years ago that "thereby hangs a tale." As has been mentioned, the attempts to use anthracite coal had been of an adverse nature until this engine of Winans came and appeared to make a "howling success" of it. Thereupon, my informant stated, it was quietly decided that this engine must be "downed," if at all possible. After close scrutiny it was found that the cylinder on one side had "slightly scraped" against something on the line, and the engine was declared unsuited for service and was run into the roundhouse at Schuylkill Haven as a companion to two Winans' "crabs" which had been retired from service. The "man from Baltimore," however, was not to be put out of the race in such a manner, and soon appeared on the scene and cut off sufficient of the flanges to furnish the necessary clearance. The "trouble hunters" next "discovered" that the engine had too much "overhang" at the rear. Again was the objection met, this time by the addition of a pair of small trailing wheels placed behind the firebox, and attached to it by springs extending from the journal boxes to pads on the sides, while steam cylinders, one on each side of the engine, were also attached to the sides of the firebox above the springs. These cylinders were open at their lower ends and took steam at their upper ends through pipes without cocks or valves. The ends of their piston rods rested in seats on the backs of the springs, and all worked fairly well unless the engine left the rail. Then the pistons usually blew out and a goodly proportion of the steam in the boiler followed, causing trouble and strong language on the part of the engine crews. After the "Baltimore" was finally considered up to the company's requirements through the addition and subtraction mentioned, Ross Winans

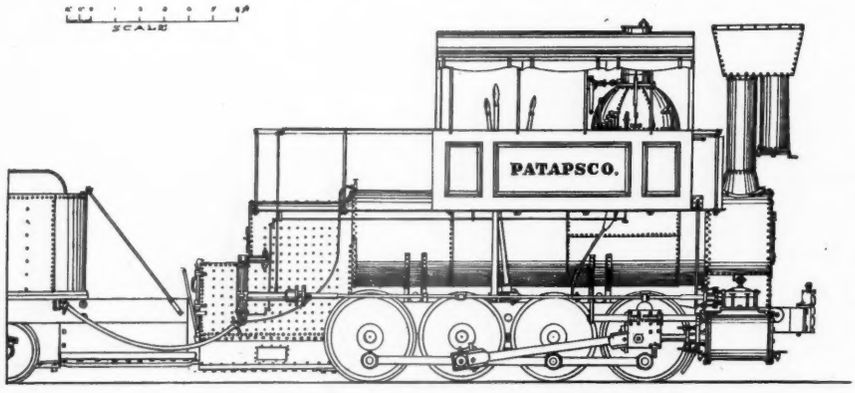


The "Massachusetts." Built by Hinkley & Drury in 1849.
Cylinders, 15x18 *in.. Drivers,* 54 *in. Weight,* 20 *tons.*



The "Perry". Built in 1849 by M. W. Baldwin. Owned First by the Pennsylvania, Then by the Reading.
Weight, 50,975 *lbs. Cylinders,* 17x22 *in. Drivers,* 44 *in.*

quickly followed it with three more of the same type, completing the number specified in the order, of which the "Baltimore" was the first. The three were named "Ohio," "Chesapeake" and "Maryland," but through some inadvertance the "Chesapeake" bore the name of an engine already in service, and the Winans' engine was then renamed "Delaware." It appears rather strange that although the "Baltimore" was the first of the type, and the one which first proved their ability to burn anthracite coal successfully in continuance service, that the "Delaware" should usually be the machine referred to in this connection both in descriptive matter and in illustrations. These engines had cylinders 18 by 22 in. and 46-in. drivers; also the drop-hook valve gear with a half-stroke cut-off driven by a cam, all of design followed on the "camel" engines of the same builder. At a later period J. Milholland rebuilt the "Maryland" and added another dome and changed the cab of the "Ohio" to the same position as those on the "camels." He also placed a cylindrical water heater in the smoke-box. This heater contained a number of small tubes, through which the exhaust passed and heated the feed-water in so doing. The arrangement heated water well enough, but affected the exhaust to some extent, yet the use of the device was continued for several years, until one day the old "crab" "Delaware," which had stood out of service for many years, was dismantled and the boiler taken to the shop to be put in order for pumping service. When the tube cover was removed, lo! there was found the same



Ross Winans' Short Firebox "Camel" "Patapsco", 1850.

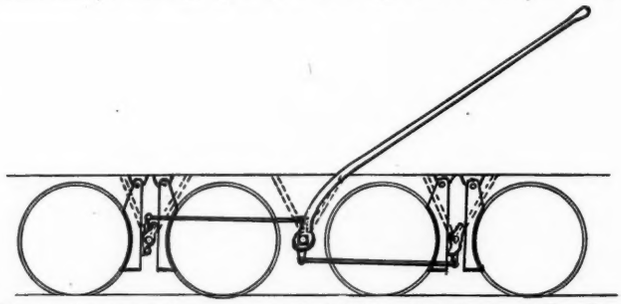
arrangement of a heater, and, worse still, covered by letters patent in the name of Ross Winans. Then the Milholland heaters were hustled out on short notice.

The success of the Winans' engines referred to, preferably suggested to G. W. Nicholls, the engineer and superintendent of the company, the designing and construction of the "Novelty," which was certainly no misnomer. This engine came out on June 21, 1847, and in the annual report for that year Mr. Nicholls writes in the following sanguine manner: "The locomotive 'Novelty' alluded to in my last report, as then building on a new principle for the purpose of burning anthracite coal has been completed and in operation since June of the present year. Her performance has been very satisfactory, fully equaling my expectations and showing no injury from the use of coal as her exclusive fuel after five months' trial and a duty of 9,357 miles run with coal trains. With such results and from her great economy in fuel, I feel confident that the main difficulties in using anthracite coal in locomotives have been overcome, and with further improvements which experience has suggested, now in progress, this road will shortly be able to use as its exclusive fuel the coal of its own region."

It is to be regretted that such high hopes failed of their realization, but in the report for 1848 the "Novelty" appears in the tabulated record of engine performances as "In shop undergoing repairs," and in the report for the next year, 1849, the entry opposite its name reads: "Boiler used for stationary engine," and its name does not appear thereafter; nor can I find any reference to it in any reports of Mr. Nicholls after that already quoted. As the "Novelty" has been so often described in various publications, it will suffice to mention that it consisted of three units, first, the usual running-gear, frames, etc., of an ordinary eight-coupled locomotive having a drum, or cylinder, substituted for the boiler; second, a boiler mounted on a separate frame which rested on two four-wheel trucks, and third, an ordinary tender.

The drum was used as a receptacle for the exhaust steam and feed-water, and was supposed to serve the double purpose of a condenser and heater. It was surmounted at its forward end by a French & Baird smokestack, probably more for appearance sake than for any other reason, as nothing passed out of it except the surplus exhaust steam from the drum.

The boiler was practically of the return flue type and had a grate surface of over 42 sq. ft. Its steam connection to the cylinders was by means of a pipe passing above the head of the engineman and fitted with swiveling metallic joints. The check-valve was on the end next to the foot-plate, and was connected to the lower part of the drum by pipes also fitted with joints similar to those of the steam connections. On account of the constant danger of these connections breaking, especially if the engine should leave the track,

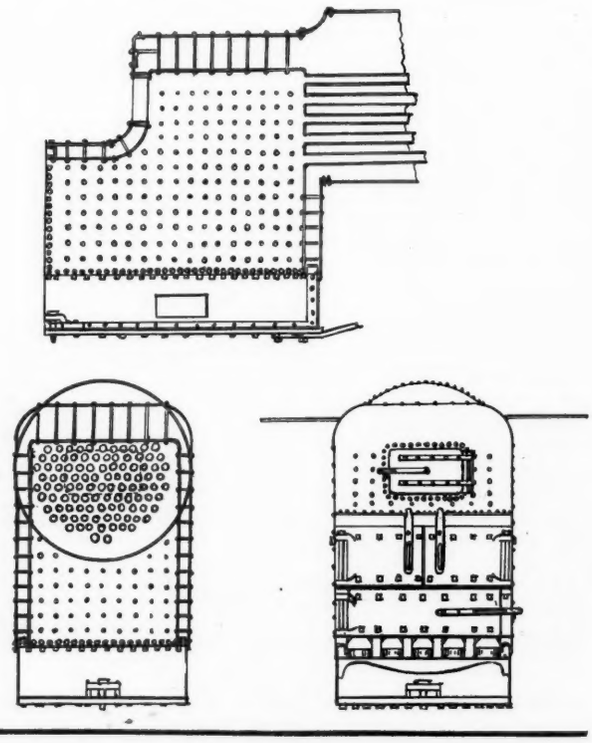


Eight-Wheel Tender Brake, 1850-1860; Philadelphia & Reading.

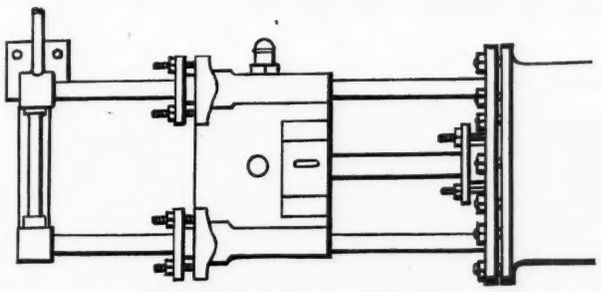
as it was very liable to do in those days of comparatively imperfect construction of roadbeds, an old employee of the Reading once said that he thought it was a very brave man indeed who would risk either running it or riding on it. Its principal dimensions were: Cylinders, 18 by 20 in.; drivers, 46 in. diameter; weight of engine proper, 43,000 lbs.

As the "Novelty" was a digression from the path of improvement which the locomotive was following, and may fitly be designated a freak, we can return to the beaten way and notice that in 1846 M. W. Baldwin built 17 eight-wheel connected engines for the company, all of which had his flexible truck on the first two pairs of drivers. Except that the capacity of the boilers was somewhat deficient, the engines were good in all other respects and continued in service for many years. Fifteen of these engines had 15 in. x 20 in. cylinders and 46 in. drivers, and two had 17½ in. x 18 in. cylinders and 42 in. drivers. Their average weight was 48,000 lbs. They were the first engines built by M. W. Baldwin with a roof over the footplates, and the first built by anyone with sandboxes.

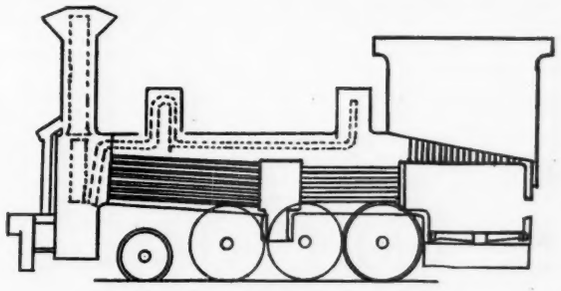
Probably but a short time previous to the building of the first of these engines, a 4-4-0 passenger engine named "Champlain" had been placed on the road by the same builder, and had his first independent half-stroke cut-off which he placed on all subsequent engines built at his shops until 1853. Both Baldwin and Norris had



Firebox of the "Patapsco."



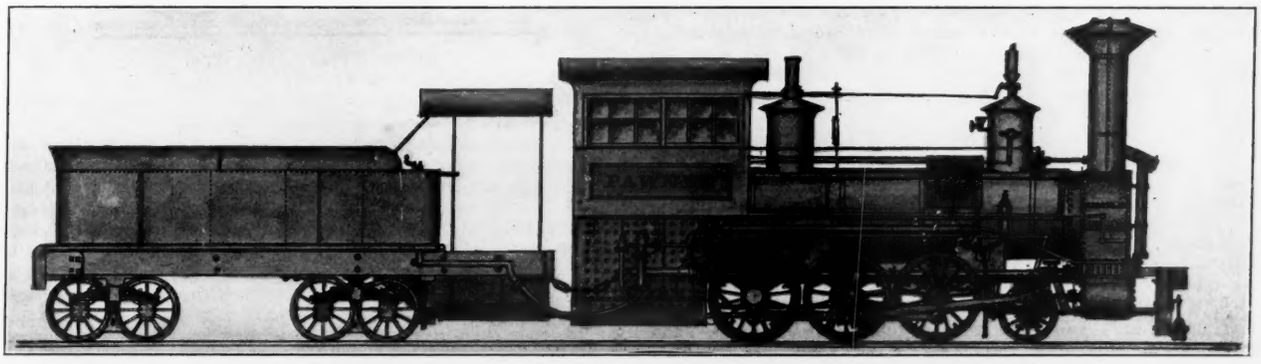
Milholland's Guide, 1851-1874.



Section, Engine "Pawnee".

also furnished some 0-6-0 freight engines beside the Richmond already mentioned.

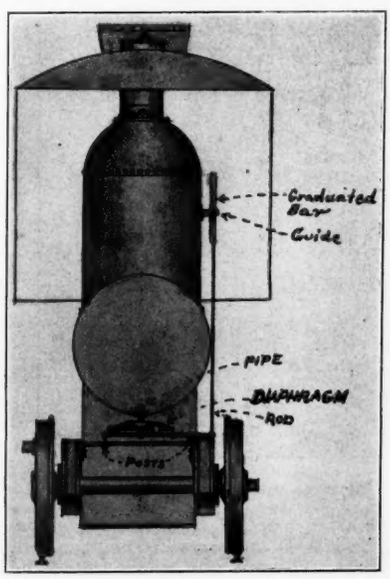
Simultaneously with the building of the four Winans engines just described, the Norris firm built the "Chesapeake," and placed it in service in April, 1847. It was the first 4-6-0 engine, or 10-wheeler, and was built under the patent granted to Septimus Norris. I have seen a number of engines built in 1862-3 with a cast-iron plate on the base of the dome-casing bearing the words, "Septimus Norris Railroad were sold by that company to the Reading, as it was feared they were too heavy for the bridges on the road of the original owner, although some other reason must have been the true one, as the selling company retained an exactly similar engine built at the same time. These engines had 17 in. x 22 in. cylinders, 44 in. drivers, and weighed 50,975 lbs. They had Bury (haystack) domes, deep horse-shoe fireboxes, a small additional dome on the waist of the boiler, and all the driving wheels between the firebox and front



The "Pawnee". Built in 1852 for the Philadelphia & Reading.

Cylinders, 18x22 *in. Drivers,* 46 *in. Pony wheels,* 30 *in. Steam pressure,* 110 *lbs. Firebox,* 42x84 *in.* = 24½ *sq. ft. grate area.*

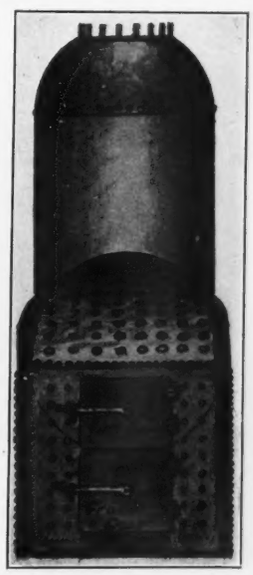
Ten-wheel Patent," and a date somewhere in the late forties, but if the description generally given of the "Chesapeake" is correct, it must have required considerable ingenuity to extend the protection of this patent over these later engines, as they had the Bissell truck of that day, while we are informed that the "Chesapeake" used no center-plates but simply a large pin which passed through a part of the truck prepared to receive it; the idea of the truck being merely to guide the engine, the weight being all thrown upon the drivers, the front pair of which was very close to the cylinders. The "Chesapeake" had a Bury dome, 46 in. drivers, 14½ in. x 22 in. cylinders, and weighed 20 tons, and in addition to using a sort of composite parallel-rod rather favored by Norris, had that one which coupled the second and third pairs of drivers carried on the pins as close to the face of the wheels as possible, while that uniting the first and second pairs was placed sufficiently far out on the pins to enable the connecting rod to grasp the main pin between the two parallel rods. This arrangement was adhered to by the Norris people for at least 15 years after the building of the "Chesapeake," although the composite form of rod does not appear on their engines after 1851.



Early Steam Gage on a Winans "Camel", Probably between 1852 and 1855.

In 1850, two 0-8-0 engines built by Baldwin for the Pennsylvania of smokebox. One of the same design was built at the same time by M. W. Baldwin for the Reading. All had a peculiar arrangement of the Baldwin hook motion, having both rockers carried in one set of boxes, one rocker being hollow and thus serving as the journal for the other.

The "Massachusetts" was a 4-4-0 engine built for the company in July, 1849, at the "Boston Locomotive Works" of Hinckley & Drury. It had inside cylinders 15 in. x 18 in., 54 in. drivers, and weighed 20½ tons. It had a peculiar form of drop-hook valve-gear with an independent half-stroke cut-off, all so arranged that the reversing of the engine and the control of the cut-off were effected from the same lever. This gear was also used on one Wilmarth engine which came under the writer's notice during the later years of its existence. The "Massachusetts" not only had inside frames, but also composite outside frames, these latter consisting of two broad plates of iron with wood centers, all being riveted firmly together. Another peculiarity is a sort of extension front into which the cinders passed from the smokestack through a pipe attached to the usual "dust hole." This same arrangement is shown on a drawing in my possession of an engine built in 1851 for a New England railroad by the Amoskeag, N. H., company.



Furnace End of "Camel" as Remodeled by James Milholland in 1863.

The "Patapsco" was a "short firebox" "camel" built for the Reading by Ross Winans in October, 1850, and with one or two more of similar design which followed it, gave such good results with anthracite coal and in other respects, that it was followed in succeeding years by other "camels" of the "long firebox" type until by 1859 the number of these engines on the road had reached 42.

This number was afterward diminished by the scrapping of one or two and the entire remodeling of others, until it dropped to 31 by 1864, but in 1868 was increased to 38 by the purchase in that year of the Dauphin & Susquehanna Railroad and its equipment. The "Patapsco" had 18 in. x 22 in. cylinders, and weighed 24$^{9}/_{10}$ tons. The long firebox "camels" had 19 in. x 22 in. cylinders; firing chutes on the sloping roof of the fireboxes; grate surfaces of about 23½ sq. ft. each., and ranged in weight from 50,200 to 55,000 lbs. With the exception of the fireboxes, of the first three, the general features of all were alike. In 1863-4 James Millholland substituted link motion for the hooks; two round guide-bars placed one above the other, for the single square bars used by Winans, and crossheads with glands on the outer ends where the guide-bars passed through. These glands are variouly stated to have been packed with Babbitt metal, rubber, hemp, lead and leather. As I believe my informants to be reliable, it is just possible that all of these materials may have been used singly at different times or on different engines. This type of guide and crosshead had been used on other engines of the company after 1851, and was the standard for many years. A few are still in use, I believe, or at least were very recently, on a number of the older engines yet in service.

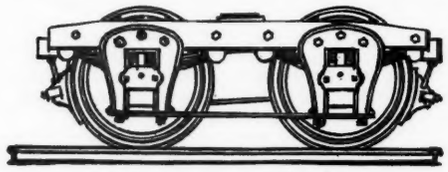
Probably the first pressure gage ever used on a locomotive in America was on engine "Minnesota," one of the first three "camels" referred to. The "Minnesota" had been built for a railroad in the New England states, and was meant to use anthracite coal, but the employees of the line were unfamiliar with the use of this fuel, and as the performances of the engine were therefore unsatisfactory, it was sold to the Reading, coming on the road soon after the "Patapsco," and also was the smallest "camel" owned by that company, its cylinders measuring 16½ in. x 22 in.; drivers 42 in., and its weight being but 22½ tons.

The steam gage referred to consisted of a diaphragm attached to a cross brace between the frames directly under the dome and attached to the boiler on its upper side by a pipe which extended up through the sheet about 5 or 6 in., in order to prevent the entrance of mud or other sediment. Its under side, which was of flexible metal, was attached to a compound lever extending horizontally across the frames. This lever was connected by short posts to the frames, and at its outer end was attached to a vertical rod which extended upwards into the cab and through a guide on the side of the dome. The upper part of this rod was flattened and contained a graduated scale from 0 to 120 lbs., which was an ample limit as the maximum pressure carried on the engine was but 100 lbs. One edge of the guide formed the point from which the pressure was indicated.

When the long-furnace camels came on the road the furnace-ends were of Winans' standard type without any water space, but of course covered by two large firing doors on their upper half, and on the lower part with a large single door to afford access to the grates and for cleaning the fire. In their later years, Millholland altered some of these, if not all, by adding a water space at each side of these ends, which then left an opening of about 18 in. in width, extending from the top to the bottom, for access to the grates.

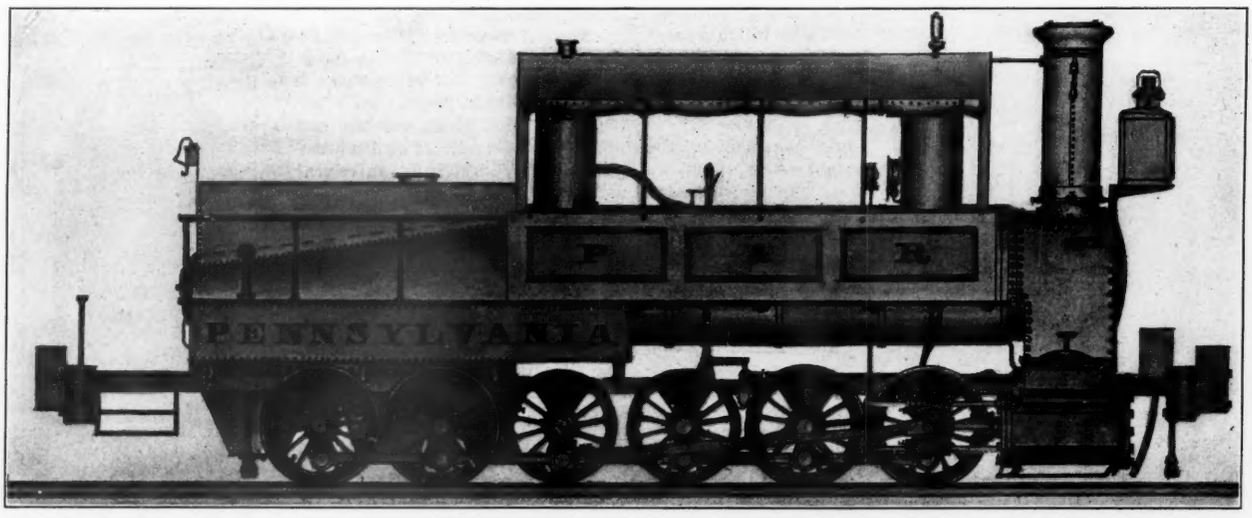
About 1869 some one thought that he had discovered an inherent and dangerous weakness in the boilers of these engines, and 17 were put out of service within a short time. The "scare" soon assumed such proportions that a sweeping order was issued to take all the rest off the road as rapidly as possible. As a result, by the end of 1870 only four remained, and these vanished into the obscurity of the scrap heap before 1871 had ruled the calendar for very many moons. Their memory, however, was perpetuated in the adoption of many of their features in subsequent engines. While this was noticeable to an extent on some other lines, it was especially so on the Reading; probably because the success of these engines in using anthracite coal made them favorites and thus impressed the other features upon the officials.

In some one of the years not far from the advent of the "camels," Lewis Kirk, who had been master mechanic of the company from 1844 to 1848, and during that time had rebuilt many of the small 0-6-0 freight engines on heavier lines, became a partner in the firm of Davenport, Bridges & Kirk at Cambridgeport, Mass., and as he was supposed to know the requirements of the Reading, an order for a 4-4-0 engine was given that firm. This engine when it came was named "Cambridge," and had 15 in. x 22 in. cylinders, 54 in. drivers, and was a close imitation of the Hinckley engines with one exception. Its weight was 24 tons, and 15 of these were on the truck. A standing joke among the employees thereafter was that they had to put the heaviest engineman and fireman in service on the footplate to "keep her down"!



Tender Truck, 1860-1874.

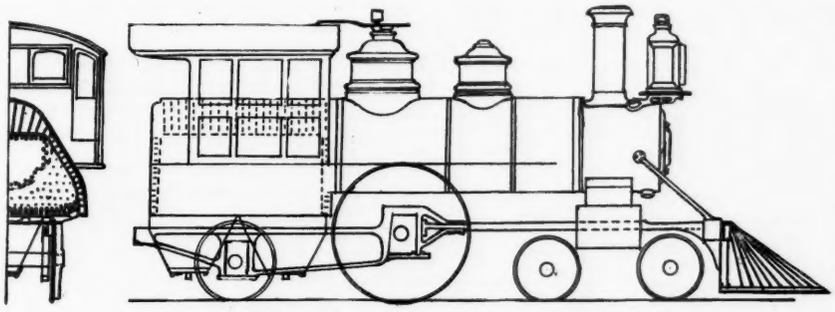
The "Pawnee" was built in 1852 by Jas. Milholland at the company's shops in Reading, and shows many earmarks of the "camel," among which are the solid end rods and sloping top firebox placed behind the frames. Its pump, however, was original in having a heater between it and the point of admission to the boiler. It also had two combustion chambers, one at the firebox end of the boiler barrel and the other about midway between the smokebox and the firebox. The flues connecting the latter with the smokebox were smaller in diameter than those leading from it to the back chamber. The "Pawnee" had three pairs of 46 in. driving wheels and one pair of 30 in. leading wheels, all set in pedestals rigidly attached to the engine frame, and all placed between the cylinders and the firebox, an arrangement which for some unaccountable reason seemed to meet the approval of some locomotive builders and railroad officials of that period, and was followed in two Norris engines and in the Smith & Perkins engines built for the Pennsylvania soon after. M. W. Baldwin also caught the "fever" slightly and built 12 for the Pennsylvania with three pairs of drivers and one pair of leading wheels in rigid pedestals on the engine frame, but with the drivers spread widely apart, the rear pair being behind the firebox. Returning to the "Pawnee," the engine of that name was the second of the class built at Reading, but as the "pony" wheels were new to the men, I have been informed that some of them thought the names Pony and Pawnee were synonymous and styled all of the class "Pawnees" as they were built, and the officials, unwittingly perhaps, adopted the same nomenclature. They were probably the first engines with the Milholland guides and crossheads already described. Galvanized sheet-iron was just becoming popular at the time of their advent, and at least one had a boiler



Engine "Pennsylvania," 1857; Philadelphia & Reading.

jacket of this material, used without the addition of any paint or varnish. These jackets soon rusted away and were replaced with the orthodox Russia iron. The "Pawnee" engines continued to be the standard for freight service for about 10 years, although a few of the later ones were built with main rods attached to the second pair of drivers. All had the Gooch (suspended) links.

In 1857 Milholland built a 12-wheel connected locomotive, without truck wheels, to be used as a pushing engine on heavy coal trains between Falls of Schuylkill and Port Richmond wharves at Philadelphia. It was named "Pennsylvania," and had a boiler somewhat like that of the "Pawnee," a cab like the Winans "camels," even to the canvas curtains instead of glazed sash, one water tank on top of the firebox, and two more placed one on each side of the boiler at the rear. No coal was carried and the firing was done at either end of the run, which was not long but strenuous. The cylinders were 20 in. x 26 in., and the drivers 43 in. in diameter, and grate surface 31½ sq. ft. The total weight of the machine was 50 tons. It is said to have performed very satisfactorily, though in later years two pairs of the drivers were removed and replaced by a four-wheel truck. In this shape it was still reported in service, bearing the number of 1449. While this engine was practically of saddle-tank type, the first saddle-tank engine as we now understand them, came on the road in 1860.



No. 507, Built by Baldwin Locomotive Works in 1880.

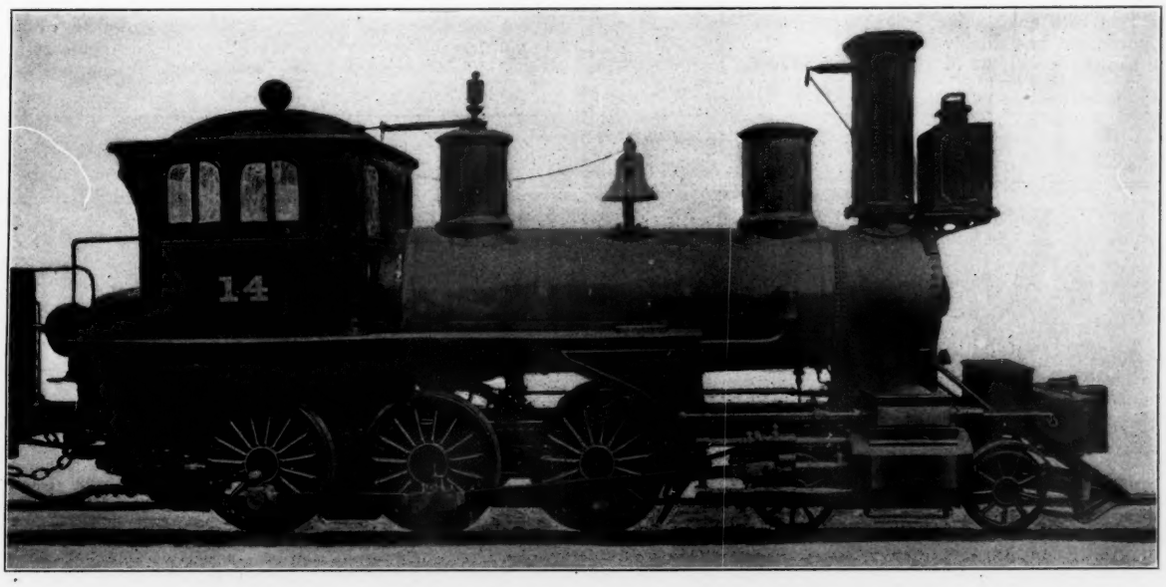
Cylinders, 18x24 in. Drivers, 78 in. Firebox, 94x96 in. = 56 sq. ft. grate area. Auxiliary cylinders under waist of boiler enabled weight on drivers to be varied from 35,000 lbs. to 45,000 lbs.

In 1862, the "Gunboat" type of freight engine used for so many years until supplanted by the larger engines after the advent of the Wootten firebox, were first built. While retaining a few of the features of the "Pawnee," they were larger and better in every way. The drivers, six in number, were 48 in. in diameter, and the cylinders 19 in. x 22 in. The weight was about 66,000 lbs. The four wheels of the truck were 28 in. in diameter. The pumps were driven by return cranks from the rear parallel-rod pins, and were of a double-action type. The frames were of composite type. Each consisted of two bars of iron about 6 in. wide set vertically about 3 or 4 in. apart, and united by thimbled distance pieces. The pedestals were separate and fastened between the bars of the frames. A number of 0-8-0 engines similar in all other respects to the "Gunboats" were also built about the same time, and many passenger engines with practically the same type of boilers. Quite a number of the "Gunboats" and passenger engines are yet running, and I have seen at least one of the 0-8-0 type within three or four years in the yard at Tamaqua.

In the latter part of 1877 the first Wootten firebox was built and put into service, and later was taken to the Paris Exhibition of 1878, where it attracted considerable attention. The barrel of the boiler of this engine, 408, was almost like that of a "Gunboat," and the cab was perched high on the sloping top of the "Wootten." After the close of the exhibition, the engine was taken to the Northern Railway of France and put into service, but not until the cab had been removed to a position forward of the firebox, and thus made the engine the forerunner of the host of Wootten engines of to-day with their cabs but a short distance behind the smokestacks and called by many "Camelbacks."

The advent of this type of firebox marked a decided change in the locomotive equipment of the company. All new engines except a few 2-8-0 built at the Baldwin works within the early years of the last decade, received Wootten fireboxes and the corresponding arrangement of cabs and other parts, and a number of old engines were rebuilt on these lines. The exceptions mentioned were intended to use soft coal, an innovation in the company's practice which occasioned no little comment in railroad circles at the time. The sloping tops of the first Wootten fireboxes was superseded in later engines by perfectly straight tops. Although consuming anthracite coal, and especially coal of inferior grade admirably, the type has never met with ardent supporters on railroads outside of the anthracite coal district, chiefly, perhaps, on account of its necessitating the separation of the engineman and fireman during much of the time the engine is running, and thus increasing the danger of accident through the engineman missing signals on account of sudden illness or death while at his post.

In 1880 the growing demand for increased speed on passenger train schedules induced the Reading Company to design and build engine No. 507 from which great results were expected, but which, like the "Novelty," failed to meet such expectations. This engine was a 4-2-2 with 18 in. x 24 in. cylinders and 78 in. drivers. It had a Wootten firebox and a steam cylinder was placed under the boiler in front of the firebox and so connected to the equalizing beams as to enable the weight on the drivers to be increased or diminished as might be required. It was built by the Baldwin Locomotive Works, and was No. 5,000 of their manufacture. After a brief service on the Reading it was sold to the Eames Vacuum Brake Co., and was taken, after a few changes to adapt it to the lines, to England to show the working of the Eames brake to the railroad officers and employees of that country. It was followed in 1895 by another 4-2-2, which gave much better results. Yet only one more of the type was built, and both were followed by many



Engine No. 14.

Built in 1866 at the locomotive works of Norris Bros., Lancaster, Pa., to working drawings of the Philadelphia & Reading's "Gunboat" type, for another company which wished to experiment with this kind of locomotive.

4-4-2 and some 2-4-2, from all of which good results in speed on heavy trains were obtained.

In recent years the company has had numerous engines built for suburban trains which appear to be well adapted to the service. They are of double-ender, tank type, 2-6-4, with 20 in. x 24 in. cylinders, 61⅝ in. drivers, and weigh 201,700 lbs.

The tenders used during the existence of the company have differed little from those of other roads. When eight-wheel types first came into use the first two pairs of wheels were arranged in a swinging truck and the last two pairs were carried in pedestals attached rigidly to the frame. Brakes were used only on the first two pairs of wheels, as it was feared that if applied to all there would be a tendency to derailment when drawn. They consisted of wooden shoes or blocks, suspended between the wheels from the frame, and actuated by short arms on a shaft which extended crosswise between the blocks, and had a long operating lever attached to the end on the right hand side. When brakes were afterward applied to all wheels, this lever was removed to an additional transverse shaft which was placed midway between the trucks and connected by short arms and rods to the shafts on the trucks. The simple type of truck used on the Winans "camels" was a favorite in the early days with the company, and was used on the "Pawnee" class and other engines. After that, a wooden frame somewhat like that of a passenger car truck was used for many years. Although some of these were very recently in use, the diamond-bar and, later, various forms of stamped-steel trucks have taken their place. A number of the small 0-4-0 saddle-tank shifting engines use a small four-wheel tender without water space to carry a moderate supply of coal.

The car equipment of the company has been referred to, and it may be added that at one time it ran its own parlor cars, but later changed them to ordinary day coaches and fell back upon the Pullman Co. for a supply of "elegance."

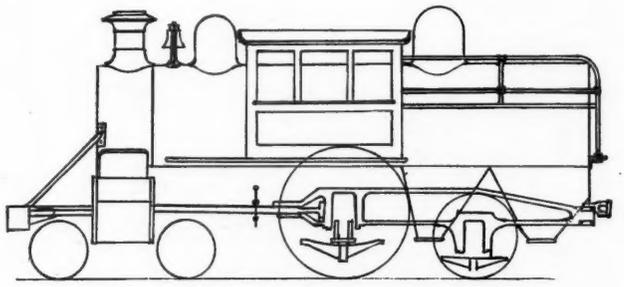
When the Philadelphia, Germantown & Norristown Railroad came into possession of the Reading it brought with it a lot of passenger coaches which were provided with gratings of about $^5/_{16}$ in. round iron bars placed about 3 in. apart, vertically, over the windows. This grating was probably meant to prevent injury to passengers from putting their arms or heads out of the windows; nevertheless it gave the whole outfit the appearance of Black Marias carrying their loads of prisoners to the penitentiary.

Another odd feature obtained by this purchase was the railroad station at the end of the Chestnut Hill branch. Here the engines were turned at the end of each trip, and as the turntable was too short to hold both engine and tender at the same time, they were always uncoupled and turned separately.

The passenger stations in Philadelphia previous to the building of the present terminal were at Broad and Vine streets for the first station in the city after the opening of the road, and removed later to Thirteenth and Callowhill streets; that of the Philadelphia, Germantown & Norristown Railroad, which became a part of the Reading system, at Ninth and Green streets; and the New York division station at Third and Berks streets—three widely separated points.

The Reading is peculiar in many respects. It, more than any other railroad, dominates the mining, hauling and shipping of the unique fuel to which it owes its origin. It has at present a mileage of 2,122, and a trackage of 4,686, the greater part of which is situated in a comparatively small portion of the eastern part of Pennsylvania. Much of this traverses what would rank among the grandest mountain scenery of the state, were it not that this same fuel which plays so important a part in the existence of the road, has changed the whole region to a region of desolation, covering it with leaden-hued culm banks and polluted streams. Even the cities and smaller towns are dingy and forbidding, the whole uniting to form a veritable black country differing in many ways from the outside world.

The road has also drawn largely for its employees on a community where "Pennsylvania Dutch," a strange patois formed of about equal parts of English, Dutch and German, is extensively used by the farmers and other descendants of the earlier settlers, and therefore by many of the employees of the railroad. Within four years I have heard an entire crew of a local freight train on the road conducting all their conversation in this tongue, as I watched them drilling cars for 20 minutes at a town within 25 miles of Philadelphia. Even the orders given to them verbally by the rather intelligent young station master were couched in the same, to me, unintelligible jargon.



P. & R. No. 385. High-Speed Passenger, Vauclain Compound, Built in 1895 by the Baldwin Locomotive Works.

Cylinders: High-pressure, 13x26 in.; low-pressure, 22x26 in. Drivers, 84½ in. Firebox, 114x96 in. = 76 sq. ft. grate area. Weight, 115,000 lbs.; on drivers, 48,000 lbs.; on truck, 39,000 lbs.; on trailer, 28,000 lbs.

The company also possesses a record of interest in the fact that a former president, Franklin B. Gowen, was able to cope with, and end forever, the fearful career of the "Molly Maguires," an organization which in the early seventies attained such a hold upon the anthracite region that operators and miners of any reputation at all conducted the plants at the risk of their lives, and too often formed the subjects of mysterious disappearances, or brutal assaults and murders committed with most extraordinary boldness; and when even people from other places, and having no connection with the coal companies, were openly insulted on the highways and streets.

Type of Suburban Tank Locomotive Now in Use on the Philadelphia & Reading.

This article must not close without reference to the valuable aid so cheerfully accorded the writer while collecting the data contained therein during past years, by L. B. Paxson, former Superintendent of Motive Power of the Reading; E. J. Rausch, who was with the locomotive department of that company during many years at the time most of the earlier engines referred to were in service; H. F. Colvin, who is also very familiar with the early equipment of that road; the Baldwin Locomotive Works; J. Snowden Bell, and an old volume prepared by E. Reuter, who was a draftsman in the service of the Reading, and from whose excellent work the drawings of the "Delaware" and "Massachusetts" have been reproduced.

GENERAL NEWS SECTION

NOTES.

The Baltimore & Ohio is to establish a police force throughout its lines, to be organized like that of the Pennsylvania lines west of Pittsburg.

On the lines of the Southern Pacific, near the Great Salt Lake, Utah, water from the lake is now regularly used to destroy weeds in the roadbed.

The railroads running east from the Missouri river have decided to apply the new and higher freight tariffs to the grain, estimated at 6,000,000 bushels, which was in elevators at Missouri river points on July 1, when the advance in the tariffs took effect. The owners of the grain had expected that it would be carried forward at the old rates.

It was announced this week in New York that the Southern Pacific had once more brought the Colorado river under complete control, and that the property in the Imperial valley and thereabouts, which was damaged or endangered by the break in the river, had been turned over again to the control of the California Development Company.

The Union Pacific and the Oregon Short Line, having received the approval of the Interstate Commerce Commission, announce, for the period between July 19 and September 1, a reduction of 25 cents a ton on coal shipped to points in Washington, Idaho and Nevada, this action being taken to stimulate the movement of coal at this season with a view to preventing a congestion in the winter.

It is announced in Madison, Wis., that Chairman John Barnes, of the State Railroad Commission, has resigned his office. The reason for this, according to the press dispatches, is the fact that the Legislature has passed a law limiting passenger fares to 2 cents a mile, in disregard of the fact that the Commission has published a decision that 2½ cents is a fair rate to be charged by the roads of the state.

The Pennsylvania Railroad publishes the following comparison of prices paid last year (1906) with those paid the current year, all of them being increases: Steel angles 31 per cent., bronze journal bearings 25 per cent., copper 22 per cent., freight car wheels 21 per cent., and malleable iron castings 20 per cent. Brass and tin have each increased 16 per cent., car axles and cross ties 12 per cent., rail braces 8 per cent., white pine lumber 8 per cent., and air-brake hose 7 per cent.

On Wednesday last the New York, New Haven & Hartford began the use of electric motors on a few of its passenger trains between New Rochelle and the Grand Central Station, New York. New Rochelle is about four miles from the junction with the New York Central and 16 miles from New York. Five regular westbound trains begin their trips at this point and these are the first to be propelled by electricity. It is expected to use the electric power farther east within a week or two.

The State Railroad Commission of Missouri has issued a voluminous report on the condition of tracks of the Missouri Pacific in that state and has ordered a reduction in the maximum rates of speed on certain sections of the road as follows: Thirty miles an hour between Jefferson City and Kansas City; 12 miles an hour on the Colorado line between Kansas City and the Kansas state line; 25 miles an hour between Kansas City and Cole Junction, and 25 miles an hour between Pleasant Hill and Joplin.

Chicago newspapers say that railroads west of that city recently declined to comply with a request to expedite shipments of agricultural machinery from the International Harvester Company, which had been delayed on the road and which were urgently needed for use in gathering the crops in Nebraska, Kansas and other Western states. The legal advisers of the roads decided that to thus favor particular shipments would be an illegal discrimination; and they declared, furthermore, that any such favor, if granted, would be subject to special odium because it would be a favor done for a "trust."

The Public Service Commission of the second district of the State of New York announces that about September 1 it will begin the investigation of car service and demurrage charges. It is the intention to give public hearings, and all shippers, consignees and railroads are asked to present in concise and orderly form any facts they may have bearing on the grievances of shippers and consignees and the best ways of curing them. Persons having grievances are reminded that vague or general statements will be of no assistance to the Commission. The railroads will be required to furnish all necessary detailed reports concerning the way in which demurrage rules now work.

The New York State Public Service Commission, second district, has appointed Frank Barry Chief of the Division of Traffic at a salary of $4,000 and Walter E. Griggs of Jamestown Chief of the Division of Tariffs at a salary of $3,000. The Commission for the first district has appointed Abel E. Blackmar Chief Counsel at the statutory salary of $10,000 a year. The same board has appointed William J. Norton, First Assistant Secretary, and J. O. Hammett Second Assistant Secretary. Mr. Norton is a mechanical engineer and Mr. Hammett has been an Albany newspaper correspondent.

The railroads leading west from Chicago expect to issue complete tariffs of reduced passenger rates this week. Through rates to points beyond the Missouri river will, in most or all cases, be made up on the basis of 2 cents a mile to the Missouri river, with the addition of the existing rate west of that river. The new rate to Kansas City is $9.20, as compared with $12.50. This difference of $3.30 is the difference between the old and the new rates to Denver and other points in the far West. Since the tariffs have been practically finished the State of Wisconsin has ordered a reduction of local fares in that state to 2 cents a mile, so that for points in the Northwest the rate clerks will have to do their work all over again. An officer of the Chicago, Milwaukee & St. Paul, denying the report that 2 cents a mile would be the rate from Chicago through to points in North and South Dakota, says that his company will make no reductions not forced upon it by the law. Rates to points in North and South Dakota are figured at 2 cents to the border of those states and 2½ cents beyond. In North Dakota the rate of 2½ cents is now prescribed by law and in South Dakota the State Railroad Commission has power to prescribe that rate.

An Advance in Rates and Reasons for It.

The Great Northern and the Northern Pacific announce that on October 1 the rates on lumber and shingles from the Pacific coast will be advanced—to St. Paul 25 per cent. (from 40 cents to 50 cents), to Chicago 20 per cent., and to Missouri river points 10 per cent., and in the announcement they say:

"The conditions that influenced the reduction in rates on lumber from the Pacific coast to the East in 1893 on completion of the Great Northern Railway no longer exist.

"(1) At that time the cut of white pine in Minnesota and Wisconsin was at its height and Pacific coast lumber could not have paid higher freight rates in competition with lumber from these nearer sources of supply. Since then the forests of Minnesota and Wisconsin have been rapidly depleted, and the consequent enhancement in value of the white pine has materially limited its competition with the Pacific coast lumber.

"(2) In 1893 the preponderance of traffic on the transcontinental roads was westbound, and without the lumber it would have been necessary to return many cars empty. To-day this condition is absolutely reversed. Cars have to be sent west empty for lumber.

"(3) The cost of operation and maintenance of the railroads has materially increased, occasioned principally by demands of the public for better service (both freight and passenger), higher wages to employees and the additional cost of supplies. In three years fir ties have increased in price 86 per cent.; fir car sills, 67 per cent.; fir car siding, 24 per cent., and fir timber, 81 per cent.

"In view of the foregoing and considering the large reductions in their gross revenue recently forced upon them by legislative action in various states, it is obvious that the present abnormally low rates are no longer warranted."

New Record Around the World.

In an interesting letter to the London *Times* Lieut.-Colonel Burnley-Campbell has been describing how to beat the record of his prototype in Jules Verne's "Round the World in Eighty Days" by circling the globe from Liverpool westward to Dover in not much more than half that time. Traveling by the Canadian Pacific route, he left Liverpool at 7.20 p.m. on May 3 and reached Vancouver at 5 a.m. on May 14 and Yokohama at 5 a.m. on May 26. Departing thence at 7 p.m. next evening he traveled across the island by rail to Tsaruga, and sailing from that port, a few hours later landed at Vladivostok at 2.15 p.m. on May 30. Then he caught the trans-Siberian train at 7 p.m. for Moscow, where he arrived at 2.38 p.m. on June 10, and finishing the journey via Warsaw, Berlin, Cologne and Ostend, landed at Dover at 2.50 p.m. on June 13. The

time consumed on the journey was thus 40 days, 19½ hours. Of course, in strictness he did not quite complete the circle, but seven hours more would have sufficed him to do so, since he could have reached London soon after 5 p.m., in time to catch the 5.55 from Euston due at Liverpool at 9.30. On the whole he had very good luck with his connections, and the only place where there was any serious waste of time was at Yokohama, where he had to stay 38 hours; but to have avoided this would not have done him any good, since there was no earlier train that he could have caught out of Vladivostok. His most anxious moment must have been in the Japan sea, when his steamer ran ashore in a fog, but in spite of this delay he had the sufficient margin of 3¾ hours at the last-named port, though if his steamer had remained aground four hours longer than she did, the result, in the absence of a train on the Siberian railroad, would have been an increase of four days in his time. The journey is a striking example of what the Siberian railroad has done in increasing rapidity of communication, for so recently as the beginning of this century, before that line was constructed, the feat would have been quite impossible.

Atchison Merits.*

Merit marks placed to the credit of various employees in the month of June:

J. W. Wright, section foreman, 10, on account of best attention being given to switch lights.

William Walck, sealer, and Charles Coleman, flagman, 10 each, for discovering parties stealing merchandise from a car.

A. H. Hill, engineer, and W. D. McCeery, fireman, 15 each, for discovering fire in car at Argentine and taking it across the main line, thus saving other cars from burning.

C. A. McKneeley, brakeman, 10, for prompt action in reporting telephone wire across track and too low to clear a man on a car, thus possibly preventing a personal injury.

W. O. Russell, agent, Duke, Texas, 15, for diving into water tank through 14 ft. of water, repairing valve and putting water tank into service without making it necessary to empty it.

W. M. Riggs, engineer, and C. D. Hill, conductor, 10 each, for extraordinary efforts put forth to keep engine alive and get freight into terminal. In this case engine on local freight had burst a flue, but by liberal use of bran and sawdust the engine was taken to terminal with but slight reduction in tonnage.

T. P. Guilfoyle, conductor, 10, for lifting four tickets on train No. 8, June 11, in the hands of wrong party. Mr. Guilfoyle is probably the most skilful conductor on the system in detecting scalped tickets.

H. G. Hadler, operator, Woodward, Kan., 10, for moving Pecos Valley trains when wires were down. Mr. Hadler started a train sheet at Woodward and handled trains for the Pecos Valley Lines until their wires were working.

*Extracts from a long list, in the Santa Fe Employees' Magazine.

New Barge Canal Engineer.

Governor Hughes of New York has appointed, subject to confirmation by the Senate, Mortimer G. Barnes, of New York city, a member of the Board of Advisory Engineers for the Barge Canal, succeeding Elmer L. Corthell, resigned. Mr. Barnes is a graduate of the University of Michigan, and has worked on the construction of many waterways, including the Birmingham Canal, the Sault Ste. Marie Canal, the Illinois & Mississippi Canal and the Panama Canal. He is at present connected with the work on the new Catskill reservoir.

The Art of Handling Men.

President Winter, of the Brooklyn Rapid Transit Company, says there are three principles. Before men will work for you they must understand: first, that you are going to be boss; second, that you know your job and theirs; third, that you are square. He is an experienced railroader, a westerner, and now has 14,000 men under him, operating more than 250 miles of street railway. One of the penalties of a high corporation position, he says, is that you lose the close contact with men—for ten years he hasn't been as close as he wanted to be.

Introduce a new head or sub-head into any working force, from a half-dozen bindery girls to a railroad division, and that force instinctively braces itself for a trial of strength with the newcomer. Then follows a shock, and one or the other wins. There can be no compromise. "When I was in the railroad business," says one corporation executive, "I kept an eye out for trouble and adjusted it." Being an acute "trouble man" is a large factor in management. Many an executive is treating symptoms, never finding the seat of the disease.

Being square with employees is important and difficult. It is easy enough to deal out justice to men under your eye. But how can it be managed over a system of 11,000 miles of railroad, or in a department store where the distance between the proprietor and some of his people is so great that one of them may starve to death without his knowing it until the newspapers begin to castigate him? Such a case happened in New York a few years ago, and to-day every employee of that merchant is required to keep at home a postal-card, addressed to the store, upon which a report of sickness must be mailed.

How are petty bosses to be controlled? President Vreeland, of the New York surface-car lines, says that wonders may be worked through firmness and intelligent sympathy with men by an executive who knows the kind of lives they lead, the anxieties that they carry about, the ambitions they have for themselves and their families. But to find petty bosses with this sympathy is a crucial matter. For lack of them many a system breaks of its own weight. * * *

In a Boston store where a board of arbitration sits on the appeal of every discharged employee, two-thirds of those who appeal are reinstated because it is found that subordinates have been unjust or worked out a grudge.

The Brooklyn Rapid Transit Company investigates even the appeal of the man whose application for employment has been denied. President Winter took up such an appeal from his desk the other day to illustrate this point, and found that it was the application of a Hebrew who charged that he had been excluded on racial lines. The real cause lay in his physical disability. But his appeal was not denied until that had been made certain. An employee with a grievance can sometimes take his case right up to the president, and even past the president to the board of directors. But good judgment must be exerted, or subordinates would be weakened in authority.

One railroad officer says he can't do much with men until he knows them, and can't know much about a man until he has seen his wife and family. This spirit seems to be growing among executives, and accounts for the social features that sprout out of welfare work, such as dinners, dances and lectures. One industrial president in the Middle West carries a photographer with him when he goes on a foreign vacation, has stereopticon slides made when he comes home, and lectures to his employees on "The Homes of the Pharoahs" or "Europe as I Found It." Probably nobody would care to pay to get into one of his lectures. But that isn't the point.

President Ralph Peters, of the Long Island Railroad, holds a reception in his office the first week in the year, and any worker on the road who can arrange his schedule is welcome to come in and shake the "Old Man's" hand.—*James H. Collins in Saturday Evening Post.*

British Comment on Hot Water Boiler Testing.

American boiler practice does not accord in many ways with British ideas, and we have several times called attention to what appear to us to be very antiquated views. Any boilermaker who here advocated that hydraulic tests should be made with hot water, on the ground that it is not so likely to injure the boiler, would be pretty generally suspected of turning out poor work, and if he urged that such a test enabled leakages or fractures to be more easily discovered, the majority of persons familiar with the subject would think he was trifling with their intelligence. Yet both these suggestions were made in a report presented by T. W. Rowe, of the Canadian Pacific Railway, at a recent convention of the International Railway Master Boilermakers, Cleveland, Ohio. The writer of the report remarks he has had little experience with cold-water testing worth relating, and is strongly in favor of hot-water in preference to cold-water testing, as being the nearest to the working conditions yet provided; and "as the material with which we construct a boiler becomes stronger up to about 600 deg. temperature, the hot-water test is not so likely to develop an injury to the boiler, and leaks or fractures are less likely to pass undiscovered." Leakages from a hot boiler are much more likely to evaporate without leaving a trace than when the water is at normal temperature. At least, this is the view which engineers here universally accept, and how the writer of the report can arrive at a distinctly opposite conclusion is beyond our comprehension.—*The Mechanical Engineer.*

Overwork in England.

Responding to an order of the House of Commons, the British Board of Trade has issued a statement showing all instances during the past eight years in which the inspectors in reporting on railroad accidents in the United Kingdom have spoken of excessive working hours. The list would appear insignificant when compared with a similar list in regard to train accidents in the United States, there being only 34 items in all. When comparing it with cases like Terra Cotta and others which have appeared in the United States Government Accident Bulletins it becomes of still less apparent consequence,

as most of the cases refer to men who had been on duty only 12 or 13 hours. Eighteen railroads appear in the list, but of the 34 items there are nine which occurred on a single road. One other road has five items. In a hasty glance through the report we find only two or there cases which would have been forbidden by a 16-hour law such as has been passed recently in this country by Congress and by a number of state legislatures. Only eight of the items, however, refer to train accidents, all of the rest being cases of men injured by other causes.

The Logic of the Situation.

"So you are in favor of government ownership?"

"Emphatically," answered the discontented citizen.

"I suppose you have studied the subject thoroughly?"

"No, I can't say I have. But I fancy it is something the railroads wouldn't like."—*Washington Star.*

Heavy Bail.

Following a slight collision on the Third Avenue Elevated Railroad at 106th street, New York city, on July 16, the conductor and motorman of the train at fault were arrested and held in $10,000 bail each, pending hearings before the court on charges of assault, or manslaughter, about 20 persons having been injured by broken glass, two of them seriously. There was a crowd of boisterous men on the leading car of the second train and, according to the reports, the presence of these men, some of whom cut off the view of the motorman, was the occasion of the negligence by which this train was allowed to run into the one ahead of it.

On Monday of this week Mr. Eustis, of the state Public Service Commission, having made an investigation, laid before the Commission a report on this collision holding that it was due to the riotous action of the passengers, for which the motorman was not to blame.

A Great Shrinkage at Pittsburg.

Atlantic City is not the Mecca of Pittsburgers this year. Instead of there being 30,000 at the resort at this time of the year, as has always been the case before, the number of Pittsburgers there at the present time will not reach 1,000. And all because the Pennsylvania, along with other railroads, has shut off free passes. In years past the Pennsylvania people required from three to four sections of the special trains that they ran for their Atlantic City excursions. This year one excursion was arranged, and the usual special train was provided. But it was not needed. Just two persons showed up with tickets. Not only is the man who rode on a pass remaining at home, but many of those who formerly paid their fares are doing likewise. This is accounted for by the fact that the man who paid his fare usually accompanied a man who rode on a pass. Because he had a pass, this man would be willing to help pay the traveling expenses of the man who didn't have a pass.—*Philadelphia Press.*

INTERSTATE COMMERCE COMMISSION RULINGS.

Grain Rates from Kansas Producing Points Adjusted.

In an opinion by Commissioner Prouty decision has been announced in the case of Farmers, Merchants and Shippers' Club, of Kansas v. Atchison, Topeka & Santa Fe and Gulf, Colorado & Santa Fe, and in the case of the same complainant against the Chicago, Rock Island & Pacific and others. These cases involved rates on grain from various points of production in Kansas. The district of origin is the same in both instances and the destinations are identical. The two cases were heard together and were disposed of in one report.

The complaint put in issue the reasonableness of defendants' rates on grain from Wichita and other shipping points in Kansas to Kansas City, Mo., and Galveston, Tex., for export and to various destinations in Texas for domestic consumption. The Commission found that the rates to Galveston for export and to the various destinations in Texas for domestic consumption are unreasonable of themselves and ordered reductions of from 3 to 5 cents per 100 lbs. to be made. It appeared that the rates from these shipping points must be the same to Kansas City, Mo., and to Kansas City, Kan., and that after the complaint was filed, the legislature of Kansas reduced by 15 per cent. the rates to the latter point, whereupon defendants, after accepting said reductions, reduced correspondingly the rates to Kansas City, Mo. For these reasons the Commission took no action concerning the latter rates. The destination points in Texas are divided into groups numbered 1, 2, 3 and 4; at the hearing, representatives of the city of Lancaster contended that that city should be transferred from group 2 to group 1, and the Commission upheld this contention. Undue discrimination against the shipping points in favor of Kansas City, Mo., was alleged, but the Commission refused to sustain that feature of the complaint.

Rates to New Mexico Points Reduced.

In an opinion by Commissioner Prouty the case of the Roswell Commercial Club and others v. the Atchison, Topeka & Santa Fe and others is decided. The complaint put in issue the reasonableness of rates between various points in the western states and Roswell, Artesia, Hagerman and Carlsbad, New Mex. The Commission held that the present class rates from Kansas City and St. Louis, Mo.; Galveston, Tex., and Denver, Colo., to these points in New Mexico are unjust and unreasonable and reductions were ordered. Certain commodity rates to the same points in New Mexico were held to be excessive. The commodity rates on grain and grain products from points in Kansas and Oklahoma were ordered reduced from 47 cents on flour and 45 cents on wheat to 42 cents on flour and 40 cents on wheat per 100 lbs. The commodity rate on lumber from points in Texas and Louisiana was ordered reduced from 45 cents to 32 cents per 100 lbs.; and that on salt in sacks from Hutchinson, Kan., was ordered reduced from 35 cents to 30 cents per 100 lbs. The commodity rates on apples, alfalfa and alfalfa meal from said points in New Mexico to Fort Worth, Tex., were held to be unreasonable and were ordered reduced from 50 cents on apples and 34 cents on alfalfa and alfalfa meal to 45 cents on apples and 30 cents on alfalfa and alfalfa meal per 100 lbs.

Parcels Express for Suburban Patrons.

In an opinion by Commissioner Prouty the case of J. E. Walker v. Baltimore & Ohio and United States Express Co. has been decided. These two companies operate, for the convenience of suburbanites, a parcels express from Philadelphia, Pa., to certain points on the B. & O. This is done by affixing stamps, which are sold at the railroad stations. The charges for these stamps are: For a package under 10 lbs., 5 cents; for a package from 10 to 25 lbs., 10 cents; for a package from 25 to 50 lbs., 15 cents. A person desiring to use this service puts the proper stamp on the package and delivers the package to an agent of the express company at the 24th and Chestnut street station of the Baltimore & Ohio in Philadelphia. The express agent cancels the stamp, bills the package to destination and turns it over to employees of the railroad company, who carry it in baggage cars. For its services the express company receives from the railroad the entire receipts from the sale of these stamps. The services of the railroad company in handling the packages are without compensation.

Previous to 1890 the Baltimore & Ohio carried without charge in its baggage cars parcels from Philadelphia to outlying stations in the vicinity. Its purpose in so doing was to increase the convenience of suburban life and stimulate suburban travel. As the amount of this business increased, much confusion and dissatisfaction resulted; whereupon the present system was adopted. The purpose of the railroad in handling packages without compensation is similarly to stimulate suburban travel. In general such packages are sent either by or for the benefit of patrons of the railroad. Packages of eatables are carried in the baggage cars of the company free up to a certain weight and at a small compensation when over that weight, provided the package is for a commuter or is carried on the train with a passenger.

The complaint in this case was brought by a person who desired to send packages from Philadelphia to Hockessin, Del., but who was, previous to August 28, 1906, refused the privilege on the ground that he was not a regular patron of the road, in spite of the fact that this privilege was in most cases open to the public generally. Since August 28, 1906, the day on which the Rate Law went in effect, the privilege has been extended to complainant and the public, but defendants insist that it is their right, if they wish, to restrict the privilege to the patrons of the road, for whose benefit it is intended. The Commission holds that on the facts previous to August 28, 1906, the complaint was well founded. To select the complainant and apply to him a particular rule not applied to the public generally was clearly an unjust discrimination. No opinion is expressed on the lawfulness of the Baltimore & Ohio's practice in transporting packages of a certain kind free only when they belong to commuters or to a passenger on the train; nor is any opinion given on the right of the defendants to restrict the privileges of the parcels express service to patrons of the road, although the defendants asked the opinion of the Commission on that point. The Commission rules, however, that it is the duty of the United States Express Co. to establish for the benefit of the public an adequate service over this same territory at a reasonable compensation. Whether the charge for the stamps affords such compensation is not now considered.

TRADE CATALOGUES.

Traction Couplers and Draft Rigging.—The Edwin C. Washburn traction devices, made by the Washburn Steel Castings & Coupler Co., Minneapolis, Minn., are described and illustrated in a 111-page catalogue just issued which is claimed to be the first catalogue devoted entirely to a complete line of couplers for traction service. The couplers are divided into three types: (1) The M. C. B., able to work on curves as sharp as 45 deg.; (2) type K, called a rigid coupling joint, and (3) type M, a simple link and pin arrangement. One hundred and fifty cars recently built by the St. Louis Car Co. for the Pacific Electric Co., of Los Angeles, Cal., are equipped with the first type mentioned. The other types are described and illustrated in detail, also traction draft riggings. The second half of the book shows a number of standard Washburn M, C. B. couplers that are considered as being peculiarly adapted to the requirements of traction service as used on steam roads; and also a design of cast-steel bolster or transom.

The Rotary Snow Plow.—In time of peace prepare for war. It is probably on this principle that a pamphlet illustrating and setting forth the merits of a rotary snow plow is issued in July by the American Locomotive Company. The value of the pamphlet lies not so much in anything new that it contains as in its reminder to those who may have forgotten that this type of plow can be driven through the deepest drifts at a speed impossible to rival by any other means of snow removal. The pamphlet contains a sketchy account of some of the performances of the rotary and their cost, a description of the machine and complete instructions about its use. It is interesting to note that the Walschaert valve gear is used. To those who are confronted with the problem of keeping a railroad open through deep snow this pamphlet should prove more than interesting.

Car Trucks, Bolsters, Underframes, Etc.—The 1907 catalogue of the Bettendorf Axle Co., Davenport, Iowa, describes the trucks, bolsters, tank cars, underframes, etc., made by this company. The Bettendorf truck with cast-steel side frame and journal boxes in one piece is well-known and has been described in the *Railroad Gazette.* The different standard and special designs are shown as well as their application to locomotive tenders and different kinds of cars. Different capacity body and truck bolsters made from standard shapes of open-hearth steel are shown. Underframes and tank cars fill the second half of the book, designs of underframes and principal parts and a number of designs of tank cars built for various users being illustrated.

Wyoming & North-Western Railway.—The Chicago & North-Western has prepared a folder on its new route to the Yellowstone National Park through Wyoming—the Wyoming & North-Western Railway. The folder tells of the resources and attractions of this "big-game" country and is illustrated with colored half-tones. There are relief maps of the part of Wyoming traversed by the new route and of Yellowstone Park. The opportunities for fishing, hunting and camping are set forth at length.

Pneumatic Tools.—A new 47-page catalogue has been issued by The Dayton Pneumatic Tool Co., Dayton, Ohio. The first half is devoted to hammers, the various styles being illustrated and described. A table gives the sizes and other essential facts about the different hammers and their work. Sand rammers, drills, hoists, holders-on, air hose, electrical drills, etc., are included in the latter half of the book, also "Climax" air compressors, which are accompanied by tables giving essential information about the different sizes.

Vises.—Catalogue No. 7 of the Emmert Manufacturing Co., Waynesboro, Pa., describes fully the company's wood workers' and pattern makers', and machinists' and tool makers' universal vises, as well as the "Tiger" parallel vise for machinists and iron workers. The illustrations show the universal vises set at different angles so as to hold the work in the most convenient positions. The catalogue gives dimensions, weights and prices of different sizes of each style of vise, as well as a price list of parts.

Track Drills.—The latest improvements in track drills manufactured by Cook's Standard Tool Co., Kalamazoo, Mich., are shown in a 12-page pamphlet just issued. The standard track drill of this company is illustrated in its various details and applications. The standard grinder and drill, and standard tool grinder are included, also lists of repair parts and prices of twist drill bits.

MANUFACTURING AND BUSINESS.

The Pullman Company has ordered applied to all its private cars Bliss axle light equipments, made by the Bliss Electric Car Lighting Company, Milwaukee, Wis.

The Central Inspection Bureau, 17 State street, New York, is inspecting 56 cars for export to South America and also a number of cars for Porto Rico, which are now being built by J. G. Brill Company, Philadelphia, Pa.

Otto Dieckman, Jr., representative at St. Louis of the Atlas Engine Works, Indianapolis, Ind., has been appointed Manager of the company's direct sales office at St. Louis. His office will be, as heretofore, in the Chemical building.

The Rostand Mfg. Co., Milford, Conn., maker of the McCarthy rack for passenger coaches, is now putting on the market a rack for parlor cars, the design of which follows closely the basic principles of the McCarthy patents with suitable additional ornamentation.

D. W. Ross, who recently resigned as Chief Purchasing Officer of the Isthmian Canal Commission, has been appointed Managing Director of the Magnus Metal Company, 111 Broadway, New York. W. H. Croft has been appointed Manager of the sales department and W. S. Bostwick General Manager.

L. W. Jones resigned on July 8 as President and Director of the Pittsburg Filter Manufacturing Company, Pittsburg, Pa. Mr. Jones had been with the company since 1903. He intends to open an office soon in Pittsburg as a consulting engineer, taking up municipal and industrial filtration plants, water softening and sewage disposal plants.

The entire issue of $13,000,000 5 per cent. 10-year convertible bonds of the General Electric Company, Schenectady, N. Y., has been subscribed to. The first payment of 50 per cent. was made on July 20 and the payment for the remainder falls due in six months. Since many of the subscribers have already paid in full, the company has, so far, realized from the new issue between $7,000,000 and $8,000,000, which is available for construction and other purposes.

The Cincinnati Planer Co., Cincinnati, Ohio, has increased its capital stock from $200,000 to $400,000. The proceeds will be used to cover the cost of the company's new plant now being built at Oakley, Ohio, a suburb of Cincinnati. This plant will be equipped with new machinery throughout and will be used exclusively for making large planers from 6 ft. to 12 ft. square. The present plant will continue to be used for the smaller sizes. Work on the new plant is now well under way and will be finished some time in September.

Gilbert Rosenbusch, C.E., of London, England, is in New York for a few weeks with address at 17 Battery Place. He is an American engineer, graduate of Stevens Institute, with ten years' residence in London, where he is an associate member of the British Institute of Civil Engineers. He has just completed his work as engineer in charge of construction of the lifts in the London underground electric railways and now proposes to introduce American mechanical and electrical specialties in Europe. He is well equipped in character, knowledge and acquaintance.

Iron and Steel.

Bids are in for about 7,000 tons of fabricated steel for freight sheds on piers 54 and 56, New York.

The New York, New Haven & Hartford is in the market for bridge steel for a lift bridge at Providence, R. I., which will require about 1,500 tons.

There are inquiries for about 7,000 tons of rails for electric lines in the Cleveland district, and sales are reported of from 1,000 to 2,000 tons of light sections.

It is thought that the Pennsylvania will re-let the contract for about 20,000 tons of fabricated steel, which was originally ordered from Milliken Bros. It is understood that the American Bridge Company has made the lowest bid, but the matter may still be adjusted between the Milliken receivers and the railroad.

The National Transcontinental Railway Commisson (Canada) has given contracts for rails and fastenings for the Grand Trunk Pacific aggregating about $1,850,000. The Algoma Steel Works, of Sault Ste. Marie, has a contract for 23,000 tons for the Abitibi section, half of which is to be delivered by November 1, 1908, and the other half in 1909. The Dominion Iron & Steel Company, of Sydney, N. S., has an order for 43,000 tons, half to be delivered before November, 1907, and the other half by July, 1908. Deliveries to be made at Edmundston, N. B., at Quebec, and at Levis, Que.

The United States Steel Products Export Company, of New York (United States Steel Corporation) has orders for 10,000 tons of 80 to 100-lb. rails to be used on extensions of the Victorian State Railways, Australia. The rails are to be rolled at the Homestead

mills of the Carnegie Steel Company. According to the terms of the contract delivery is to be begun within 90 days. Orders have also been given to the same company for 12,000 tons for the Imperial Government Railways of Japan, 6,000 tons for the Cananea, Yaqui River & Pacific, Mexico, and for about 1,000 tons of heavy girder rails for the Municipal Electric Traction lines of Christchurch, New Zealand.

OBITUARY NOTICES.

Augustus R. Macdonough, formerly Secretary of the Erie, died on July 21 at his home in New York city. Mr. Macdonough was 86 years old. He was born at Middletown, Conn., and graduated from Yale in 1839. He studied law and practiced for a short time in St. Louis and then came to New York. He was Secretary of the Erie for 25 years, resigning about six years ago.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

Central of Georgia.—James A. Blair has resigned from the Board of Directors.

Chihuahua & Pacific.—Philip Baber has been appointed Auditor, with office at Chihuahua, Mex.

Illinois Central.—A. G. Hackstaff, Vice-President, has been elected a Director, succeeding John C. Welling, deceased.

Maine Central.—Arthur P. Foss has been appointed Auditor of Disbursements, with office at Portland, Me.

Mobile, Jackson & Kansas City.—Ambrose Monell, Thomas Morrison and John McLeod have resigned from the Board of Directors. R. D. Scandrett, of Pittsburg, has been elected a Director.

New York, New Haven & Hartford.—John F. Stevens has been appointed Vice-President in charge of operation, with office at New Haven, Conn., effective August 1.

Pennsylvania.—George T. Smith, General Agent at New York, has been elected Chairman of the Lighterage Committee of the Trunk Line Association, succeeding W. B. Pollock, resigned.

St. Louis, Brownsville & Mexico.—John D. Finnegan, Treasurer, has been elected also Assistant Secretary, with office at Kingsville, Tex.

Operating Officers.

Boca & Loyalton.—H. H. Griffiths, Superintendent of the Western Pacific, has been appointed General Manager of the Boca & Loyalton, succeeding W. S. Lewis, resigned.

Canadian Northern.—M. H. Macleod, Chief Engineer, has been appointed General Manager, with office at Winnipeg, Man., succeeding E. A. James, resigned.

Corvallis & Eastern.—George F. Nevins, Assistant General Manager, has been appointed General Superintendent, and his former position has been abolished. The office of General Manager, formerly held by G. W. Talbot, who recently resigned to go to another company, has also been abolished.

Mobile, Jackson & Kansas City.—W. F. Owen has been appointed General Manager and Assistant to the President.

Oregon Railroad & Navigation Company.—W. M. Gleason has been appointed Assistant Superintendent at Starbuck, Wash., succeeding L. F. Pennington, assigned to other duties.

Western Pacific.—George A. Brown has been appointed Superintendent, with office at Stockton, Cal., succeeding H. H. Griffiths, transferred. See Boca & Loyalton.

Engineering and Rolling Stock Officers.

Baltimore & Ohio.—E. Conniff, general foreman at Holloway, Ohio, has been appointed Master Mechanic at Benwood, W. Va., succeeding F. C. Scott, resigned.

Buffalo, Rochester & Pittsburg.—E. J. Govern, Assistant Engineer of Bridges, has resigned.

Illinois Central.—L. A. Downs, who was recently appointed Assistant Chief Engineer of Maintenance of Way, was born in 1872 at Greencastle, Ind. He graduated from Purdue University in 1894, and began railroad work on the Vandalia. He then went to the Illinois Central, where he has been ever since, serving first as Assistant Engineer and then as roadmaster on, successively, the Amboy, the Louisville, the Louisiana, the Springfield and the Chicago divisions.

New York Central & Hudson River.—W. O. Thompson, Division Superintendent of Motive Power at Oswego, N. Y., has been appointed Master Car Builder at East Buffalo, N. Y., succeeding James Macbeth, deceased.

Traffic Officers.

Chicago & Alton.—John H. McAdoo has been appointed General Agent at Pittsburg, Pa., succeeding T. C. Frew, resigned.

Colorado Southern, New Orleans & Pacific.—C. C. Cary has been appointed General Agent at Opelousas, La.

Las Vegas & Tonopah.—George F. Knight has been appointed General Agent at Goldfield, Nev.

Louisville & Nashville.—See Missouri Pacific.

Missouri Pacific.—Charles L. Stone, General Passenger Agent of the Louisville & Nashville, has been appointed to the new office of Passenger Traffic Manager of the Missouri Pacific, with office at St. Louis, Mo.

Western Maryland.—Thomas G. Smiley, Assistant General Freight Agent, has been appointed General Freight Agent, with office at Baltimore, Md., succeeding W. T. Hunter, transferred. W. A. Cox, General Agent at Baltimore, Md., succeeds Mr. Smiley.

Buffalo, Rochester & Pittsburg.—Robert Ward Davis, who was recently appointed Freight Traffic Manager, was born at Union Square, N. Y., in 1857. After a common school education he began railroad work in 1872 on the Syracuse Northern, now part of the New York Central & Hudson River. He was station agent at Union Square from 1876 until 1880, when he went to the Rome, Watertown & Ogdensburg as train despatcher. He was later made ticket agent at Watertown and then Traveling Auditor. He was appointed train-despatcher in 1882 and two years later was made traveling freight agent. After a few months he was made also chief clerk in the general freight office, holding both positions until 1892. He then went to the Rochester & Pittsburg as General Freight Agent and held the same office on its successor, the Buffalo, Rochester & Pittsburg, until his recent promotion.

R. W. Davis.

LOCOMOTIVE BUILDING.

The Public Belt Railroad (New Orleans) is asking bids on locomotives.

The Michigan Central is said to be contemplating the purchase of 30 locomotives.

The San Antonio & Aransas Pass, it is understood, is about to order some locomotives.

The Great Northern has ordered two locomotives from the American Locomotive Company.

The Northern Pacific has ordered five switching locomotives from the American Locomotive Company for the Portland & Seattle.

The Tunisian Government has been authorized to buy from abroad 38 narrow-gage locomotives. For information apply to Bureau of Manufactures, Washington, D. C., referring to Foreign Trade Opportunity No. 1220.

The Pennsylvania Lines West, as reported in the *Railroad Gazette* of July 12, have ordered five class E-2b (Atlantic) locomotives from the Altoona-Juniata shops. The 45 freight locomotives mentioned have not been ordered.

CAR BUILDING.

The Duluth & Iron Range is about to order 800 ore cars.

The Grand Trunk is asking prices on 5,000 freight cars.

The Canadian Pacific is asking prices on 1,000 box cars.

The Oklahoma Central is to order new equipment within 60 days.

The Public Belt Railroad (New Orleans) is asking bids on cars.

The Western Maryland is said to be in the market for 1,000 freight cars.

The Illinois Tunnel Company, Chicago, is asking prices on 500 small dump cars.

The Chicago, Burlington & Quincy is said to have ordered 1,300 additional steel cars.

The Kansas City Southern, it is said, is considering the purchase of some freight equipment.

The Oklahoma Central is said to be in the market for 500 coal cars of 80,000 lbs. capacity.

The Lake Superior & Ishpeming is considering the purchase of 150 ore cars of 100,000 lbs. capacity.

The San Antonio & Aransas Pass is understood to be about to order some passenger and freight cars.

The Toledo & Ohio Central has ordered one combination mail and express car from the Pullman Company.

The Detroit & Toledo Shore Line, it is said, has ordered 400 coal cars from the American Car & Foundry Company.

The Western Maryland denies being in the market for 1,000 freight cars, as reported in our advance sheet of July 17.

The Washington, Idaho & Montana, it is understood, has ordered 50 flat cars from the American Car & Foundry Company.

The Southwest Missouri (*Electric*) has, it is said, ordered three single and three double truck cars from the Jewett Car Company.

The Duluth & Iron Range is in the market for four passenger coaches, two combination and two combination baggage and mail cars.

The Tampa Northern, it is said, has ordered 75 flat and 75 box cars of 60,000 lbs. capacity from the Baltimore Steel Car & Foundry Company.

The Central Railroad of New Jersey has ordered 1,000 hopper bottom coal cars of 100,000 lbs. capacity from the Cambria Steel Company. These cars will measure 30 ft. long and 9 ft. 5⅝ in. wide, inside measurements, and 31 ft. 6 in. long, 10 ft. wide and 10 ft. 4 in. high, over all. The bodies and underframes will be of steel. The special equipment includes:

Brake-beams	Diamond adjustable
Brake-shoes	Am. Brake-Shoe & Fdry Co., steel back
Brakes	Westinghouse
Brasses	Magnus metal
Couplers	R. E. Janney
Door fastenings	Simonton hopper door rigging
Draft rigging	Miner
Journal boxes	Symington
Springs	Simplex Railway Supply Co.
Trucks	Andrews cast-steel side frame, Barber lateral device

RAILROAD STRUCTURES.

Beaver, Pa.—The Pittsburg & Lake Erie bridge over the Ohio river is to be replaced with a new structure. The plans call for a bridge over the river starting 200 ft. east of the old structure on the Beaver side, with a shore pier on the West Virginia bank of the river 500 ft. above the old bridge. The channel span is to be 767 ft. long, and for 531 ft. of this span it will be 90 ft. above low water. The War Department has been asked to grant the necessary permission to put up the structure.

Brookhaven, Miss.—The Illinois Central, it is said, will put up a brick passenger station, 32 ft. x 196 ft., to cost about $25,000. Contract reported let to George P. Swift & Co., of Chicago. The work to be finished within 90 days.

Buffalo, N. Y.—Contractor John Johnson, of Buffalo, is said to have been the lowest bidder for the stone and concrete work on the elimination of grade crossings for the New York Central & Hudson River at East Buffalo. The bids were in two sections. The first for the work at Bailey avenue and Broadway crossings, on which the bids were: Stone masonry, $149,261; monolithic concrete, $139,373, and reinforced concrete $135,026. The second section was for crossings on the line between Kensington avenue and Amherst street. They were: Stone masonry, $129,822; monolithic concrete, $122,262, and reinforced concrete, $112,785. The city is to pay part of the cost, aggregating about $200,000, and the Grade Crossing Commission has voted to ask the Common Council to authorize an issue of bonds for that amount.

Butler, Pa.—The Baltimore & Ohio, it is said, is planning to put up a new freight house also a passenger station here, and increase its yard facilities.

Glendon, Pa.—Bids will soon be asked for building a steel and concrete bridge over the Lehigh river, to replace the old covered bridge. The cost is to be borne by the county of Northampton, the Lehigh Coal & Navigation Company and the Lehigh Valley Railroad. The borough of Glendon is to do the grading on the approaches.

Vancouver, B. C.—Contracts are reported let by the Canadian Pacific for putting up a pier 670 ft. long and 166 ft. wide to cost about $300,000. A number of similar piers are to be built at the C. P. terminals here.

Washington, Pa.—J. W. Sheldon, of Fayette county, one of the promoters of an electric line from Masontown to Waynesburg, is negotiating with the Greene county and Fayette county commissioners to build a bridge over the Monongahela river at a cost of about $150,000. The electric line is to pay one-third of the cost.

West Albany, N. Y.—Bids were recently asked for by G. W. Kittredge, Chief Engineer of the New York Central, Grand Central Station, New York city, for putting up a steel, concrete and brick boiler shop 125 ft. x 430 ft. and 40 ft. high. Separate contracts are to be let for the structural steel to be used in the construction.

RAILROAD CONSTRUCTION.

New Incorporations, Surveys, Etc.

Alexandria, Zimmerman & Northwestern.—Incorporated in Louisiana, with $230,000 capital, to build a line from Alexandria, La., northwest to Zimmerman, 35 miles. J. A. Bentley, President; E. W. Zimmerman, Vice-President; A. F. Sharpe, Secretary, and P. Lisso, Treasurer.

American Midland.—Local reports say that this company has been incorporated in Oklahoma with a capital of $20,000,000 and office at Guthrie. The company proposes to build a north and south line from Langdon, N. Dak., south through the Dakotas, Nebraska, Kansas, Oklahoma, Indian Territory and Texas to Galveston, 2,100 miles; also a branch from Winnsboro, Tex., east to Shreveport, La., and one from Coalgate, Ind. T., east to Poteau. The incorporators include: Henry Oppenheimer, C. F. Senkowsky, F. Jerome, H. Meyer and L. Linden, of New City; B. F. Hagler, Jr., U. C. Guss and C. R. Havinghorst, of Guthrie.

Arkansas Anthracite.—This company, incorporated in 1904 with a capital of $4,500,000, to build a line from Fort Smith, Ark., east to Clarksville, in Johnson county, about 65 miles, has been granted an extension of 18 months to begin the work. The directors include: R. M. Remmel, C. McKee, G. Heim and others. The Arkansas Anthracite Coal Company is also interested in the project. (See Arkansas Anthracite & Western, May 4, 1906, p. 136.)

Atlanta & Carolina Construction Company (Electric).—Incorporated in Georgia with $5,000,000 capital, to build an electric line from Atlanta east to Augusta, 160 miles. Surveys made from Atlanta to Conyers and from Athens to Augusta, leaving about 50 miles to be surveyed. J. W. English, President, Atlanta; Mathew Mason, Vice-President, and M. T. Edgerton, Secretary.

Atlantic Northern & Southern.—Contracts are reported let to the Engineering Construction & Securities Company, of Chicago, Ill., for building this proposed line from Manning, Iowa, south to Villisca, about 75 miles. Surveys made and rights of way obtained from Kimballton south to Atlantic. (May 24, p. 726.)

Beaumont, Sour Lake & Western.—See Colorado Southern, New Orleans & Pacific.

Charleston, Westfield, Marshall & Terre Haute Interurban.—Incorporated in Illinois, with office at Marshall, to build an electric line from Charleston, Coles county, east via Westfield, to the Illinois-Indiana state line, 35 miles. The incorporators include: James Dawson, S. Hurst, N. Bennett, M. L. Briscoe, W. B. Scholfield, T. M. Berkley, E. T. Pinnell and W. R. Patten.

Charlotte Harbor & Northern.—This company announces that its line from Arcadia, Fla., south via Hull, Fort Ogden and Liverpool to Boca Grande, 53 miles, is completed and is to be opened for traffic August 1. From Arcadia to Liverpool, 17 miles, the line has been in operation for freight only for some time past. (March 15, p. 381.)

Chesterfield & Lancaster.—This road is said to be in operation to a point 20 miles west of Ruby, S. C., and the company plans to extend it northwest towards Charlotte, N. C., or to Concord.

Chicago & North-Western.—It is reported that contracts will soon be let for grading an extension of the line from Bellefourche,

S. Dak., north about 100 miles to the northern border of South Dakota.

CHICAGO, BURLINGTON & QUINCY.—Work, it is said, is to be started at once on an extension of the line from Guernsey, Wyo., northwest to a connection with the Chicago & North-Western at Orin Junction, about 40 miles.

CHICAGO, ROCK ISLAND & GULF.—Track is reported laid for about 3½ miles on the extension this company is building from Irving, Tex., which is on the Fort Worth-Dallas line of the Rock Island, north to Carrollton, on the St. Louis & San Francisco, 11 miles.

CINCINNATI (OHIO) BELT LINES.—Surveys are to be made for a proposed belt line around Cincinnati. John E. Bleekman represents the interests which will finance the project. If the survey is satisfactory steps will be taken at once to begin the work. (See Cincinnati Intersecting, March 29, p. 467.)

COLORADO SOUTHERN, NEW ORLEANS & PACIFIC.—The Beaumont, Sour Lake & Western extension from Sour Lake, Tex., west to Houston, 64 miles, is reported finished, and the old line from Beaumont to Sour Lake, 22 miles, has been reconstructed to form part of the through line from New Orleans, La., west to Houston, 360 miles. Work is under way on the section from Baton Rouge to De Quincy, 137½ miles. The tracks of the Kansas City Southern are to be used from De Quincy to Beaumont, 47 miles, and the tracks of the Yazoo & Mississippi Valley from Baton Rouge to New Orleans, 89 miles. It is expected to have the whole line in operation early in September. (March 15, p. 382.)

COLUMBUS, MEMPHIS & PENSACOLA.—This company proposes to build a line from Aberdeen, Miss., on the Illinois Central, the Mobile & Ohio and the St. Louis & San Francisco, south to Columbus, on the Mobile & Ohio and the Southern, about 25 miles. H. E. Reynolds, President; C. Y. Reynolds, Vice-President; B. L. Reynolds, General Manager, Aberdeen, and C. B. Hopkins, Secretary and Treasurer, Columbus.

DEFIANCE, PAULDING & FORT WAYNE (ELECTRIC).—Reports state that this company is to be incorporated in Ohio to build an interurban line from Defiance, Ohio, southwest to Fort Wayne, Ind., with a branch from the main line a few miles south of Defiance south to Paulding. It is intended to eventually extend the line from Defiance northeast via Toledo to Detroit, Mich. H. F. Schnelker and W. S. Rogers, of New Haven, Ind., and Fort Wayne are interested.

DOLGEVILLE & SALISBURY.—This company is building an ore line from the mines of the Salisbury Iron Company at Salisbury, N. Y., southeast to a connection with the Little Falls & Dolgeville at Dolgeville, N. Y., about five miles. W. H. Switzer, President and General Manager; E. L. Wells, Vice-President, and F. R. Switzer, Secretary and Treasurer, all of Utica. The directors include E. Fairchild, of Salisbury; A. M. Mills, of Little Falls, and C. Sullivan, of Dolgeville.

ELYRIA SOUTHERN (ELECTRIC).—Incorporated in Ohio with $100,000 capital and office at Cleveland. The company proposes to build an electric line from Elyria, Ohio, south through Lorain, Medina, Wayne, Ashland, Richland and Knox counties, about 60 miles. The incorporators include W. E. Elliot, F. W. Carpenter and F. L. Sargent.

FLORIDA CENTRAL.—Incorporated in Georgia to build a line from Thomasville, Ga., south to the Georgia-Florida state line, about 13 miles. J. L. Phillips, of Thomasville, and associates are incorporators.

GAINESVILLE, TEXAS & SOUTHWESTERN.—Incorporated in Texas, with office at Gainesville, to build a line from Gainesville, Tex., southwest to Mineral Wells, about 80 miles. The incorporators include: E. C. Bell, of Toledo, Ohio; E. M. Wickey, of East Chicago, Ind.; W. W. Newberry, of Chicago, Ill.; J. M. Lindsay and John King, of Gainesville.

IDAHO NORTHERN.—Contract reported let by this company for building 35 miles of its proposed line from Kingston, Idaho, which is on the Oregon Railroad & Navigation Company's line, northeast to Murray, about 22 miles, thence south to Wallace, on the O. R. & N. and the Northern Pacific, 20 miles. B. F. O'Neill, President of the State Bank of Commerce at Wallace, is President. E. P. Spaulding, of Spokane, Wash., is also interested.

ILLINOIS & NORTHWESTERN (ELECTRIC).—Incorporated in Illinois with $10,000 capital and office at Chicago. The company intends to build an electric line from Lyons, in Cook county, south to Bloom, about 15 miles; also a number of branches. The incorporators include: A. B. Konsberg, E. J. Cady, C. P. Chamberlain, H. S. Martin and W. E. Phillips.

KENTUCKY NORTH & SOUTH.—Surveys are nearing completion and plans made to soon start work on this proposed line. The route is from Fullerton, Ky., on the Ohio river opposite Portsmouth south to Bristol, Tenn., about 200 miles, where connection is to be made with the Southern Railway. (June 21, p. 917.)

LOUISIANA & PACIFIC.—See Shreveport, Alexandria & Southwestern.

MADISON COUNTY INTERURBAN BELT.—Incorporated in Illinois with $35,000 capital and office at Highland. The company proposes to build an electric line from Staunton, in Macoupin county, southeast via New Douglas, thence south through Grantfork to Highland; and thence southwest via St. Jacobs and Troy to Collinsville, in Madison county, about 45 miles. W. P. Wall, J. Gebrig, J. Wild, J. L. Rhein and J. Pardill are incorporators.

METTOWEE VALLEY.—Incorporated in Vermont to absorb the Manchester, Dorset & Granville Railroad. The M., D. & G. was organized to build from Manchester, Vt., northwest via Dorset to Granville, N. Y., 25 miles, and the road finished to Dorset, eight miles. It is now proposed to extend the road from South Dorset to Granville. C. L. Leach, President.

MEXICAN INTERNATIONAL.—This road, it is reported, is to be extended from Tepehuanes west via the Topia mining district to Culiacan, 225 miles, where connection is to be made with the Western Railway of Mexico, operating a line from Culiacan west to Altata on the Pacific coast, 38 miles, recently reported bought by the Mexican government. The latter road is to be rebuilt and extensive improvements made at the port of Altata, which is midway between the ports of Topolobampo and Mazatlan.

Surveys reported made for a branch from Durango south to Guadalajara, 400 miles. (March 15, p. 396.)

MEXICAN ROADS.—The state of Chihuahua, Mex., has granted a concession to Jose Batello to build a line from Parral to San Jose Delsito, 60 miles.

A concession has been granted to Pablo Olivas, of Prieto, by the state of Chihuahua, Mex., to build a line from Allende northeast to Jiminez, about 75 miles.

MIDLAND VALLEY.—The branch building from Jenks, Ind. T., to Glen Pool, 6½ miles, is nearing completion, and trains will be run soon. It is reported that this is to form part of an extension from Jenks, Ind. T., southwest to Shawnee, about 100 miles.

MISSOURI, KANSAS & TEXAS.—Local reports state that work is under way on a second track from Parsons, Kan., south to Muskogee, Ind. T., on the Cherokee division. This division, which is 117 miles long, is to be shortened to about 100 miles. It is estimated that the work will take three years to finish, and cost about $2,000,000.

MOBILE, JACKSON & KANSAS CITY.—President L. S. Berg, of this company, is reported as saying that the road is to be extended from its present northern terminus at Middleton, Tenn., north about 100 miles to a point on the Ohio river.

NASHVILLE, CHATTANOOGA & ST. LOUIS.—Contract reported let to Toney & Lawler, of Chattanooga, Tenn., for grading a five-mile branch from Tracy City, Tenn., to coal mines at Pryor Ridge.

NEVADA & CALIFORNIA.—See Southern Pacific.

NEW YORK, AUBURN & LANSING.—Application has been made by this company to the New York Public Service Commission for permission to make a new mortgage for $2,000,000, half of which is to cover the cost of double-tracking the 37 miles of road from Auburn to Ithaca and installing a third-rail electric service. (March 15, p. 387.)

OAXACA & EJUTLA.—This company, operating a line from Oaxaca, in the state of Oaxaca, Mex., south 43 miles to Ejutla, is reported planning to build an extension south to the Pacific coast, about 60 miles.

OVERTON COUNTY.—This company, operating 19 miles of railroad from Algood, Tenn., northeast to Livingston, is planning to build an extension northeast to a connection with the Cincinnati, New Orleans & Texas Pacific at Burnside, Ky., 75 miles.

PARAGOULD & MEMPHIS.—This company, which proposes to build an extension from Cardwell, Mo., north to Poplar Bluff, 50 miles, and one from Cardwell west to Paragould, Ark., 17 miles, has located the line for the last named. Extensions are also projected from Manila, Ark., southwest to Marked Tree, 30 miles; also from Manila southeast to Osceola, 16 miles. (March 15, p. 389.)

PENNSYLVANIA.—This company, it is said, is planning to build a branch from the Indiana branch at Twolicks, Pa., east to a connection with the Cherrytree & Dixonville at Clymer, about 15 miles.

PEOPLES RAILWAY CONSTRUCTION COMPANY.—Organized in Texas to build a line from Tyler, Tex., northwest to Canton, about 40 miles. B. B. Cain, President; J. Durst, of Tyler, Vice-President; T. Butler and S. Bruck, of Tyler, and D. F. Clark, of Canton, are interested.

PEORIA & ST. LOUIS.—It is reported that a company under this name is being formed in Illinois to build a line from Dixon, Ill., northeast to Belvidere, about 50 miles. The names of the promoters are not given.

Perla Northern.—This company, operating a logging road from Perla, Ark., northwest to Whittington, 18 miles, is said to be building an extension northwest, also an extension from Perla southeast to a connection with the Wyandotte & Southeastern.

Sacramento Valley & Eastern.—An officer writes that this company is building a line with its own forces from Pitt, in Shasta county, Cal., three miles east of Kennett, along the north bank of Pitt river to the mouth of Squaw creek, thence via Copper City to Delamar, 16 miles. About five miles has been graded. The work is heavy, being mostly through rock. Maximum grades 4 per cent. and maximum curves 20 per cent. There are to be two bridges; one over Sacramento river and the other over McCloud river. Some of the work may be let if bids from contractors prove satisfactory. D. W. Riordan, President, New York, and F. J. Dearborn, Chief Engineer, Winthrop, Cal.

St. Francis.—Incorporated in Arkansas to build a line from Parkin, Ark., on the St. Louis, Iron Mountain & Southern, south about 20 miles to Round Pond, on the Chicago, Rock Island & Pacific. E. E. Taenzer, W. D. Darnall and others, of Memphis, Tenn., are incorporators.

St. Louis & San Francisco.—This company, it is said, has recently appropriated funds for double-tracking work on its road between St. Louis, Mo., and Springfield. Surveys are reported made for building a cut-off from Crocker, Mo., east to Rolla, so as to shorten the line between these two towns from 36 miles to 30 miles.

Shreveport, Alexandria & Southwestern System.—The Louisiana & Pacific extension from Fulton, La., is in operation south to Banks, 16 miles from Fulton, and it is said work is under way from Banks south to Lake Charles, eight miles. Plans are reported being made to build an extension from the northern end at De Ridder to Cravens, 10 miles. (June 14, p. 879.)

Southern Pacific.—An officer writes that preliminary surveys are being made for an extension of the Nevada & California from its southern terminus at Keeler, Cal., south to Mojave, about 120 miles.

Tennessee & Georgia Interurban.—Incorporated in Georgia with $500,000 capital to build an electric line from Rossville, Ga., southeast via Ringgold to Catoosa Springs, about 25 miles. J. R. Jones, J. C. Brayn and J. W. Clark, of Catoosa county, and W. H. Payne, of Chattanooga, Tenn., incorporators.

The Suffolk Syndicate Co.—This company, which has mortgaged its property for $200,000, is believed to intend using the proceeds to build an electric railroad from Patchogue, N. Y., westward through the villages and towns along the south shore of Long Island. John W. Wells, of New York city, is President.

Union Pacific.—Contracts, it is said, will soon be let for laying a new second track from Hanna, Wyo., west to Rawlins, 40 miles, to cost about $1,000,000. The work also includes the elimination of curves and the building of a number of cut-offs to shorten the line. Similar work is also to be carried out from Wamsutta, Wyo., west to Robinson, 20 miles, and from Rock Springs to Green River, 16 miles, at a cost of about $1,000,000. Surveys are reported made and work is to be started at once on a cut-off from Robinson, Wyo., west to Point of Rocks, 27 miles. The line is to be seven miles shorter than the existing road.

Western Railway of Mexico.—See Mexican International.

RAILROAD CORPORATION NEWS.

American Light & Traction Company.—A quarterly dividend of 1½ per cent. on the outstanding $6,738,700 common stock has been declared payable August 1. The annual rate was 5 per cent. during the fiscal year ended June 30, 1907. In the first half of 1906, 2 per cent. was paid; 1905, 3½ per cent., and in 1904, 1½ per cent. The company owns or controls gas, lighting, power and traction companies in Wisconsin, Minnesota, Michigan, Texas, New Jersey, New York, Colorado and Canada.

Baltimore & Ohio.—See Chicago Terminal Transfer.

Buffalo, Rochester & Pittsburg.—This company has applied to the New York Public Service Commission for permission to issue $1,300,000 additional equipment trust notes.

Chicago, Burlington & Quincy.—See Chicago Terminal Transfer.

Chicago Terminal Transfer.—The Baltimore & Ohio is said to have offered $30 a share for the preferred stock held by minority stockholders. There is outstanding $17,000,000 4 per cent. noncumulative preferred stock, of which the Burlington is believed to own over 70 per cent.

Chicago Union Traction.—This company has sold about $4,000,000 first-mortgage 5 per cent 25-year bonds to the First National Bank of Chicago. It is said that probably $6,000,000 more will be sold at once. The proceeds are for rehabilitation. (July 19, p. 84.)

Detroit & Charlevoix.—See Michigan Central.

Florida East Coast.—This company, which operates 484 miles of road from Jacksonville, Fla., south, has sold to Harvey Fisk & Sons, New York, $3,000,000 three-year 6 per cent. notes; they are secured by bonds of the railroad company and also, it is said, by the endorsement of H. M. Flagler, President of the company, who owns the road. It is supposed that the notes were sold to raise money to pay for the extension from Homestead along the Florida keys to Key West, about 125 miles, on which work has been under way for the past two years.

Kansas City Southern.—Earnings and expenses for the month of June, 1907, and for the year ended June 30, 1907, were as follows:

Month of June, 1907.			
Gross earnings	$870,428	Inc.	$208,448
Operating expenses	508,606	"	25,900
Net earnings	$361,822	Inc.	$182,548
Taxes	15,583	Dec.	437
Net earnings, taxes deducted	$346,239	Inc.	$182,985
Year Ending June 30, 1907.			
Gross earnings	$9,284,884	Inc.	$1,531,993
Operating expenses	5,486,539	Dec.	157,991
Net earnings	$3,798,345	Inc.	$1,689,984
Taxes	190,925	"	16,884
Net earnings, taxes deducted	$3,607,420	Inc.	$1,673,100

Michigan Central.—According to press dispatches, this company has bought the Detroit & Charlevoix, which runs from South Arm, Mich., to Frederick, on the Michigan Central, 44 miles, with an eight-mile branch. The Detroit & Charlevoix is a logging road and has $520,300 stock outstanding.

Milwaukee Electric Railway & Light.—This company has increased its authorized common stock from $15,000,000 to $20,000,000. A subsidiary, the Milwaukee Light, Heat & Traction Company, has increased its authorized common stock from $1,000,000 to $30,000,000. The parent company owns 103 miles of road and controls all the gas and electric lighting companies in Milwaukee.

Mobile, Jackson & Kansas City.—L. S. Berg and associates have bought half of the controlling interest heretofore held by Alexander McDonald, W. D. Stratton and E. K. Stallo. (July 19, p. 84.)

New York, Auburn & Lansing.—This company has applied to the New York Public Service Commission for permission to make a mortgage for $2,000,000, of which $1,000,000 is to refund outstanding bonds and the rest is for double-tracking and electrifying the company's road from Auburn, N. Y., to Ithaca, 37 miles.

Santa Fe Central.—It is understood that finances of this company are to be reorganized and the road consolidated with a coal and iron company and several real estate companies. The road runs from Santa Fe, N. Mex., south to Torrance, 117 miles, and had a 47-mile branch from Moriarity Junction to Albuquerque under construction at the beginning of the present year. It was reported over a year ago that C. W. Tallmadge, of Chicago, had bought the road. It has outstanding $2,500,000 stock and $2,000,000 first-mortgage 5 per cent. bonds of 1941.

Southern Pacific.—The estimated income account for the year ended June 30, 1907, is as follows:

Gross earnings	$124,864,440	Inc.	$19,245,326
Operating expenses	82,578,907	"	11,992,257
Net income	$42,285,533	Inc.	$7,253,069
Other income	3,665,365	"	211,220
Total income	$45,950,898	Inc.	$7,464,289
Fixed charges and rentals	19,423,833	"	2,497,937
Available for dividends	$26,527,065	Inc.	$4,966,352
Dividends, preferred stock, 7 per cent.	2,769,879		.....
Available for common	$23,757,186	Inc.	$4,966,352
Dividends, common stock, 5 per cent.	9,892,463	"	4,946,217
Surplus	$13,864,723	Inc.	$20,135

Union Pacific.—The estimated income account for the year ended June 30, 1907, is as follows:

Gross earnings	$75,781,115	Inc.	$8,499,573
Operating expenses	42,222,464	"	5,258,691
Net earnings	$33,558,651	Inc.	$3,240,882
Other income	11,028,252	"	3,260,761
Total income	$44,586,903	Inc.	$6,501,643
Fixed charges and rentals	8,652,622	Dec.	230,794
Available for dividends	$35,934,281	Inc.	$6,732,437
Dividends, preferred stock, 4 per cent.	3,982,006	Dec.	25
Available for common stock	$31,952,275	Inc.	$6,732,462
Dividends, common stock, 10 per cent.	19,548,790	"	3,998,398
Surplus	$12,403,485	Inc.	$2,734,064